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YE WHO ARE OF FAINT HEART

¶ Have you that feeling, "Oh, what's the use?"

¶ Does the world seem to be taking it out of *your* hide?

¶ Are your creditors discourteous, treating you as the under dog?

¶ Do you feel like quitting the business altogether?

¶ Well, just ruminate for a moment, now.

¶ What are *you* doing in the plumbing business, anyway?

¶ Do you conduct your business in a way to inspire the confidence of your customers?

¶ Do you ask for your work *all* it is worth, and insist on getting it?

¶ Do you realize that the *profitable* work goes to the hopeful, optimistic plumber who gets all it is worth, and delivers the goods?

¶ Are you that hopeful, optimistic plumber?

¶ In this Year of Plenty 1912, isn't it about time that you sized yourself up for what you *are* worth, and really got down to business in a business way?

¶ If *you* can't look out for Number One, who in Plumberdom is going to?

Heating and Ventilation in Post Office at Jersey City, N. J.

By H. L. Alt

SHARING in the general prosperity of the country and inclined to make the most of its opportunities, Jersey City cannot be blamed for being somewhat elated over the fact that together with the other new construction work which is now in progress it has been honored by the United States Government deciding to erect a fine new Postoffice Building which is located near the Stations of the Central Railroad of New Jersey, the Pennsylvania Railroad and Lehigh Valley Railroad as well as being near the water front. The work on this Postoffice is now well under way. The construction is still far from final completion and it is for that reason that a few of the minor points have not yet been finally decided.

The heating and ventilating system, however, has been pretty well laid out on all the important particulars, and a description with illustrated drawings should prove quite interesting to those associated with this class of work and is briefly contained in the following:

The heating and ventilation of this building is divided into three portions: The direct steam heating system, the indirect fresh air system and the exhaust or foul air removal system.

Direct Heating System.

The steam supply is furnished by means of two horizontal return tubular boilers each about 66 inches in diameter and 14 feet long. The tubes in these boilers are of 4 inch diameter, unstaggered, and are spaced 5½ inches on centers both vertically and horizontally, except the two vertical rows in the center which are 7 inches apart. Total number of tubes is fifty-two and the top row is located 9 inches above the center level of the boiler. The shells are 5/16 inch and the heads of ½ inch thick open hearth steel; all longitudinal seams are located in the upper quarter of the shell and are double riveted lap joints with ¾ inch diameter rivets, on 2⅞ inch centers and staggered.

These boilers are placed in brick settings with facebrick on the exterior and fire brick protecting the exposed interior portions. The fronts are of paneled cast iron with a minimum thickness of ½ inch and securely held to the brickwork with wrought iron tie rods. The grates (which are 5 feet 10 inches wide x 6 feet 8 inches deep) are of the dumping type and are designed to burn No. 2 Buckwheat coal, being set over an ash pit which is 6 ft. deep. The entire space in the pit in front of the boilers and ash pits under the grates is covered with vitrified brick laid on edge and grouted with cement mortar. The location is plainly shown on the basement plan, Fig. 1.

The feed water for these two boilers is taken from the water supply main on the basement ceiling and is connected to the main return pipe and is provided with a check valve and a stop valve on each side of check. The blow-off connection from each boiler is of wrought iron being provided with an asbestos packed blow-off cock and blow-off valve and is run to a cast iron blow-off pot. This pot is set with its bottom on the pit floor and is about 36 inches in diameter and 42 inches deep. The cover is bolted on and a bolted manhole about 6 feet 9 inches is also provided. From the top of the pot a 2 inch wrought iron vapor line is run over to the vent shaft and up the shaft to the underside of the louvers. A 3 inch overflow of cast iron pipe and extending to near the bottom of the pot on the inside is connected into the drainage system. The boilers are equipped with 3 inch safety valves set for 10 pounds release, a low pressure 30 lb. steam gauge with 6 inch dial and the other customary accessories.

Automatic regulation is furnished by an automatic damper regulator which is connected to the main damper in the smoke duct which is operated by water pressure. Installed in the smoke connection for each boiler is an easy moving damper of No. 12 gauge sheet steel with quadrant hand control so that they can be locked in any position, if desired.

In the main smoke duct the damper is of the balanced, louver type with its operation governed by the damper regulator. The smoke flue itself is built of No. 12 gauge sheet iron with 12 inch x 16 inch cleanout doors, and is supported by 5/16 inch x 1 inch wrought iron hangers.

The 40 inch diameter smoke stack into which the flue is connected is built of ¼ inch tank steel in the lower half, and 3/16 inch in the upper. It is made in sections of about 5 ft. in length, all vertical seams being lap riveted and all horizontal seams made with 3/16 inch thick outside butt strips 4 inches wide, which are riveted to the top edge only of each section. The rivets are ⅜ inch diameter and are spaced about 3 inch centers. Near the bottom of the stack a 12 inch x 16 inch cleanout door is set in a frame. This stack is set on a square bed plate of ¾ inch cast iron which projects a minimum of 6 inches beyond the stack at all points.

The steam piping is of standard weight wrought iron with standard weight cast iron steam fittings. Unions under 2½ inches in size are all brass, ground joint and those over 2 in. are standard cast iron flange unions. Wherever necessary to bring the bottoms of the mains on the same level eccentric tees and offset reducing couplings are used. In general the bottom of all steam mains at the ends of the runs are kept at least 2 feet above the water level, in the boiler. Figs. 1, 2, 3 and 4 show the plans of the basement, first floor, second floor and attic respectively.

Steam is supplied to the coil in the hot water boiler through flow and return connections, both of which are provided with a gate valve, while in addition the return has a check as well; there is an equalizing pipe run from the bottom of the steam header into the return main, both of which are indicated in Fig. 1. The horizontal mains and returns are sloped about ½ inch in 10 feet and are supported by adjustable expansion hangers at intervals of about every 10 feet. The return pipes along the walls are hung in similar manner while those in trenches under the floor are carried on rollers consisting of short sections of pipe.

The vertical pipes passing through the floors are all protected with galvanized iron thimbles and where woodwork comes in dangerous proximity a lining of No. 26 gauge galvanized iron is installed. The horizontal pipes run in the fireproof construction (excepting in the basement trenches), have semi-circular, flange edged, cover plates of No. 24 gauge galvanized iron to form an air space around the pipe and to provide for contraction and expansion.

The pipe trenches in the basement are built with masonry and concrete walls and have ½-inch thick cast

iron cover plates which are diagonally channeled and set flush with the floor line.

In general all the valves on the heating system are of the double-seat-gate type, those of 2 inches and smaller being standard weight, red brass composition screw valves, and those over 2 inches being standard weight, iron body, brass mounted either screw or flanged valves. The radiator valves on the direct radiators and connections to heating and tempering coils (if temperature control is used) will be diaphragm valves on both the flow and return connections, while if temperature control is not installed the diaphragm valves on the heating and tempering coils will be omitted and the direct radiators

The radiators used are of the cast iron sectional type of the heights and areas shown in the plans Figs. 1 to 4, inclusive, and are set parallel with the walls against which they are placed and as close to the wall or panel back as possible. All direct radiators excepting those located under windows are equipped with deflecting shields. These shields which are of No. 24 gauge galvanized iron start at a point about leg height of the radiator above the floor and extend about 2 inches above the top of the radiator with the two sides and top curved so as to deflect the air from the wall.

The covering used on the steam heating system is 1 inch sectional, removable, 70 per cent magnesia or as-

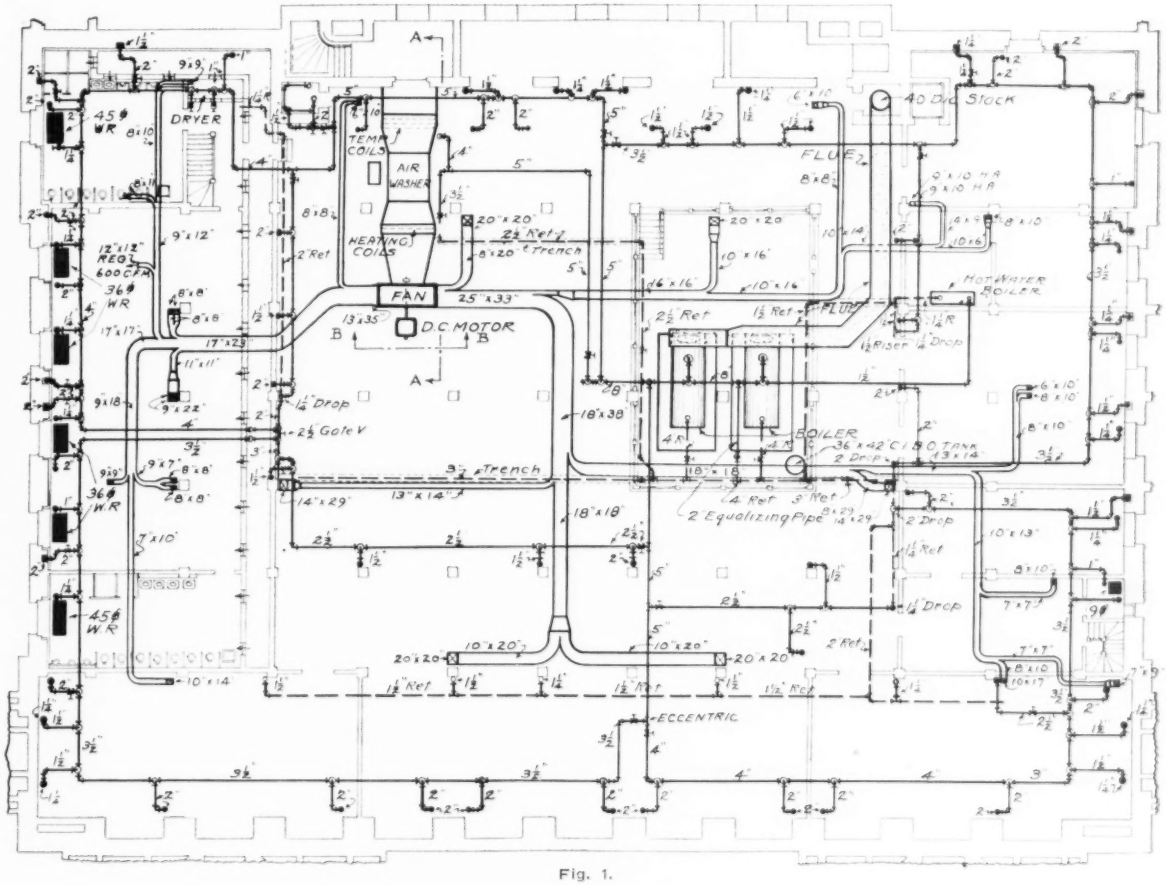


Fig. 1.

will be supplied with nickel plated extra heavy red brass composition radiator valves with rough body, finished trimmings, and elastic discs, and union connections. (At this writing the matter of temperature control has not yet been finally decided.) The stems on all direct radiator valves in corridors are of the lock shield type and are provided with detachable keys, and all stems of all direct radiator valves (except those on the basement ceiling) are set vertically. If the air removal system is installed, all radiators, tempering and heating coils, hot water boiler and ends of steam mains will have air valves as described for the air-removal system, but if this system is not put in, ⅛ inch nickel plated automatic air valves will be used on the radiators, and the ends of the steam mains; each section of the tempering, and reheating coils, the aspirating coil, and the drying coils will have ⅜ inch automatic expansion type air valves.

bestos covering, with a 5 oz. to the yard duck jacket put on with No. 36 gauge tin lacquered bands ¾ inch wide. The bands are spaced 18 inches apart on the straight runs, two bands being located at each ell and three at each tee. The fittings and valves are covered with plastic material or sectional removable coverings. The plastic covering is of the same thickness as the corresponding pipe covering and is similarly jacketed and banded.

On the boiler breeching and top of boiler shells the covering is composed of plastic material of 1½ inches in thickness and with a hard surface finish the whole being applied against wire mesh which is kept away from the breeching by the use of 1 inch steel spacers, thus leaving a 1 inch dead air space.

A dryer is installed in the basement and contains two indirect radiators each of about 66 square feet of prime heating surface. On the return from each radiator is

placed an air valve similar to the ones used on the fan coils and the air supply is furnished by a connection from the hot air fan. These indirect radiators are set in a brick chamber and all spaces on the sides are blocked up by fillers of No. 18 gauge galvanized iron. Above the indirect radiators in the wall is placed a 14 inch x 22 inch cast iron cleanout door and frame. The dryer is equipped with coat hooks arranged 9 inches apart along 2-inch x 3-inch galvanized angle irons.

An aspirating coil is installed in the air shaft and consists of approximately 270 lineal feet of 1½-inch pipe. This coil is 16 pipes high, the pipes being on 3½-inch centers and the vertical header on each end is a cast iron branch tee with 2-inch run and 1½-inch branch.

ing is 42 inches in diameter and both wheel and fan are constructed of heavy sheet steel, well braced. On the inlet side of the fan a single bearing is provided which is supported on a steel pedestal in order to form as little obstruction to the passage of the air as possible. The other end of the shaft is supported on the bearings of the motor which is direct connected and runs at a speed of 330 revolutions per minute. The motor is of 10 horsepower, and takes direct current at 500 volts. The fan is set on a concrete foundation with a 2 inch thickness of compressed cork between the fan and the concrete. The exposed edges of this cork are protected by a 16 oz. sheet copper top which is flanged under the base angles of the fan and secured substantially at the bottom.

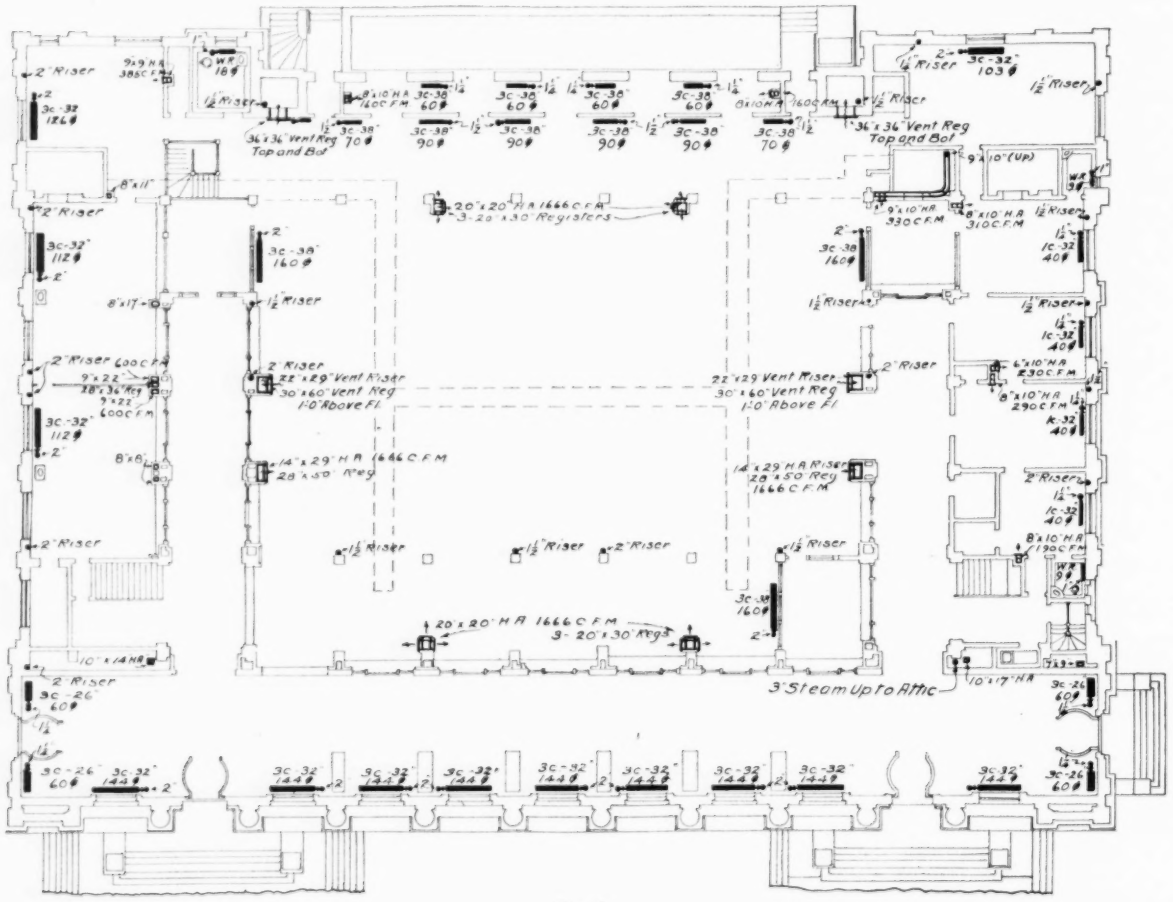

36"x36" Vent Reg Top and Bot
20"x20" H.A. 1666 C.F.M.
3-20"x30" Registers
22"x29" Vent Riser
30"x60" Vent Reg 1'-0" Above Fl.
14"x29" H.A. 1666 C.F.M.
28"x50" Reg
3" Steam up to Attic

Fig. 2.

Indirect Heating.

The heating and tempering coils consist of wrought iron pipe screwed staggered into cast iron boxes the free area being 20 square feet. The tempering coil has three 4-row deep sections and the re-heating coil has 4-row deep sections.

These sections are about 5 ft. 6 inches high, each containing approximately 250 square feet of heating surface. They are supported on 13-inch brick piers at each end and are located as close to the ceiling as possible.

The fan is of the steel plate double-outlet centrifugal type with a 5 ft diameter wheel 32 inches wide. The top discharge is of about 875 square inches area and the upblast opening of about 235 square inches. The inlet open-

The motor is set on an independent foundation and has a speed regulating device which allows a speed of 330 revolutions per minute, although the normal speed is only 265 revolutions per minute. This is accomplished by the insertion of resistance in the field circuit while the speed can be cut down to about two-thirds of the normal speed by the insertion of resistance in the armature circuit. Both front and side elevations of the fan and motor are shown in Figs. 5 and 6 which are views taken on Line "A-A" and Line "B-B" in Fig. 1.

The air washer is of the spray type and includes a spray chamber, tank, eliminator, circulating pump, motor, piping, etc., and is of a capacity sufficient to purify 16,500 cubic feet of air per minute. The spray chamber is fitted

with spraying devices arranged so that they may readily be cleaned and all piping inside of the washer is of galvanized wrought iron pipe with heavy cast brass beaded fittings. The tank below the spray chamber is about 16 inches deep and is constructed of galvanized iron stiffened with galvanized angles spaced about 24 inches apart. The spray chamber and eliminator are incased in galvanized iron and are provided with galvanized iron partitions to prevent any air passing around the purifiers. Between the eliminator and spray chamber is an 18-inch by 36-inch door set in a cast iron frame and with a glass panel in the top. In the spray chamber is installed a waterproof globe set in conduit with a guard for one 40-watt incandescent light, the globe being located so as best to light the interior of the spray chamber when viewed from the glass panel in the door.

The water supply is taken from the pipe near the ceiling through a double seat gate valve and ½-inch branches fitted with gate valves are run to a ½-inch high pressure ball cock in the spray chamber tank with a large sized float while another branch is led to a washout connection. The tank is fitted with 2-inch overflow and 2-inch drawoff, the latter being provided with a double-seat gate valve which is set in a concrete box having cast iron cover. The overflow and draw-off pipe are connected to the sewer through a 2-inch extra heavy cast iron running trap with cleanout plugs set flush with the basement floor. The drain pipe is of extra heavy cast iron hub and spigot pipe.

To operate the spray a centrifugal pump is used which is driven by an electric motor taking 500 volts direct current and direct connected to the pump. Both pump and motor are set on a single solid cast iron sub-base and the pump suction is connected to the tank with a galvanized wire-mesh strainer in the tank. The discharge from the pump is connected to the sprays and has a 5-inch dial pressure gauge in a japanned-iron case. An elevation showing the position of this air washer between the tempering and the heating coils is shown in Fig. 5.

All the hot air supply and foul air removal ducts, flues and risers are constructed of the best quality heavily galvanized sheet iron, and all turns are laid out with the radius of the throat equal or greater of the width of the duct. The horizontal ducts in the basement (as shown completely in Fig. 1) are hung by means of bands of No. 12 gauge galvanized iron and about 1 inch wide and spaced in general about 10 feet apart, while the vertical risers are secured to the walls, columns, etc., in a similar manner.

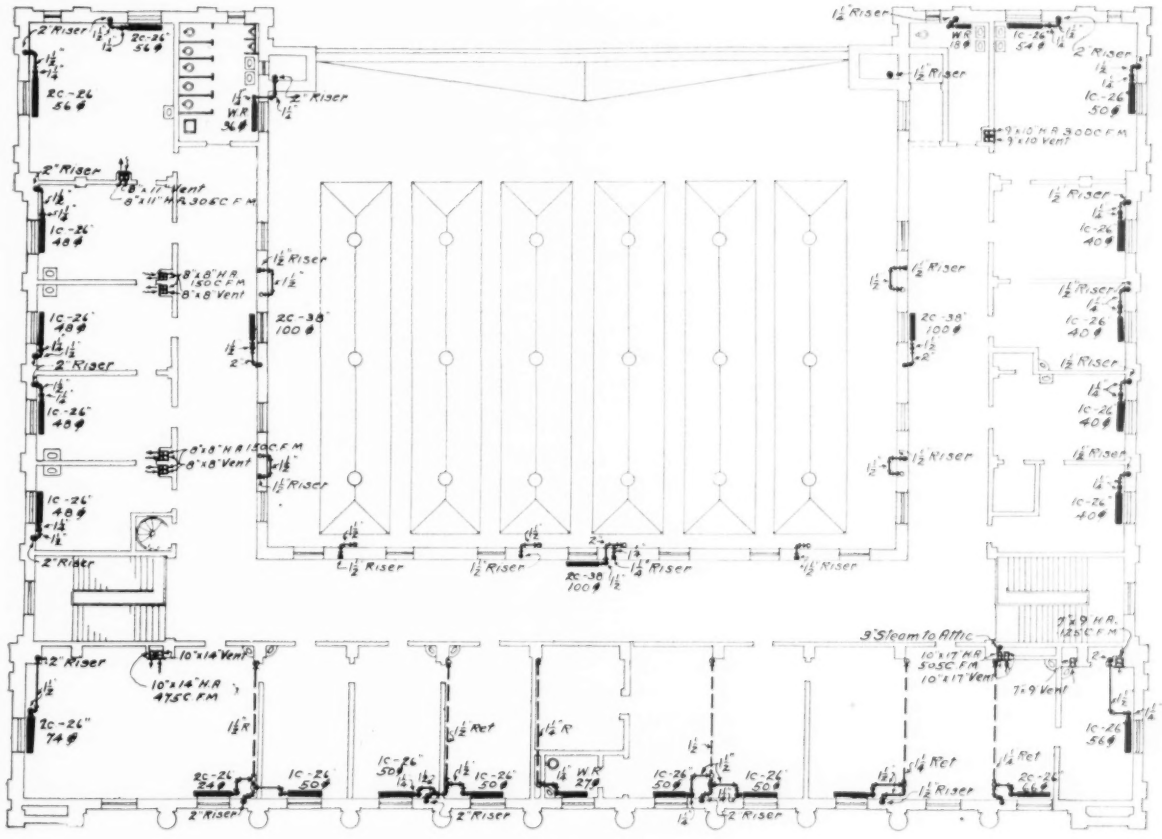


Fig. 3.

Balanced volume dampers are placed in the air ducts in the basement in each branch to each outlet or riser. These dampers are made of galvanized iron of two gauges heavier than the duct in which they are placed and are provided with iron operating lever with an iron quadrant secured to duct. The lever and the quadrant being capable of securing the damper in any position between wide open and shut and fully indicating such position. The radii of these quadrants is made about ⅓ the width of the duct.

At each branch connection to a main is a fixed deflector

of the same weight of galvanized iron as that of the main duct which after being adjusted to give the amount of air required from each outlet is permanently secured in position. For this purpose a suitable handhole with a sliding cover is left in the main duct to give access.

All the steel work from the fresh air inlet to the tempering coil, from the tempering coil to the air washer, from the air washer to the heating coil, and from the heating coil to the fan inlet is of No. 12 gauge sheet steel. Each separate compartment of these connections has a 24 inch x 30 inch door of the same material with rigid frames and three heavy hinges together with two fastening devices. All this sheet steel work and the outside of the fan casing and air washer are painted two coats of metallic paint; galvanized iron air ducts are unpainted.

A 4-inch brick curtain wall is built under the heating and tempering coils between the piers supporting same and a 28 inch x 28 inch louver type by-pass damper is installed both under the heating coils and the tempering coils. These dampers are of sheet steel with cast iron journal boxes and easy moving bearing and are provided with levers and quadrants similar to those on the ducts. The door in the basement which is used as a fresh air inlet is covered with galvanized iron wire screen set outside the doors which open inward. The screen is No. 12 B. & S. gauge galvanized iron wire of 1-inch diamond mesh and is set in a galvanized iron channel frame.

The hot air and vent registers are of plain lattice design; those in the toilet rooms being of white finish and all others of black japan. The hot air and top vent registers have brass safety link operating chains with brass indicating pulls. All of the registers are of cast iron with louver valves. All register openings have cast iron wall frames with the mouth of the air duct brought out in front of the frame and flanged over under the edge of the register face. A strip of asbestos paper is laid in asbestos cement between the galvanized iron flange and the edge of the register face against which the registers are screwed.

Exhaust System.

The exhaust system in this building consists of two vertical air flues with an aspirating coil in one and the smoke stack in the other. Connection is made into these flues at the first floor and third floor with registers and ducts as shown in Figs. 2 and 4. There is no exhaust fan or other mechanical means for exhausting the air beyond the natural tendency of the draft in the flues caused by the heated air rising tending to draw in the air from the rooms and thus remove it from the building.

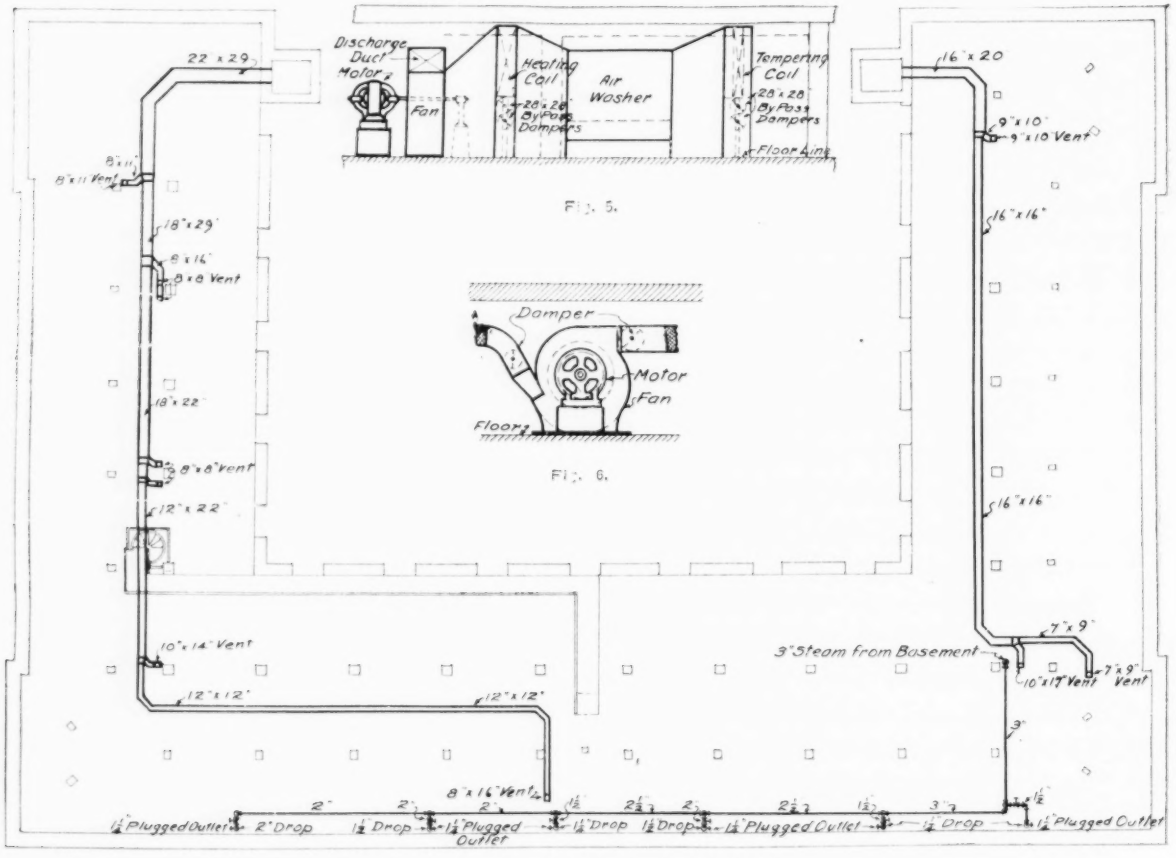


Fig. 5.

Fig. 6.

Fig. 4.

Vacuum System.

The air removal system in connection with the heating and ventilating of this building is operated by an electric driven exhauster which is installed on a concrete foundation with cast iron bedplate. There is an automatic governor controlling the operation of the motor so as to maintain a constant pre-determined vacuum on the air lines. From the air valves lines of piping are run to the air exhauster and from each direct radiator air valve a ¼-inch pipe is dropped to the floor and the horizontal

run in the floor is made with ⅜-inch pipe. All these air lines are run so as to grade uniformly toward the exhauster without sags or pockets and consist of wrought iron pipe with cast iron fittings both galvanized. The discharge from the exhauster terminates over a cesspool which has a running trap through which it is connected into the sewer.

A system of automatic temperature controlling apparatus for both the direct radiation and the indirect blast system may be installed although this matter has not yet been finally decided. If installed it will consist of thermostats set about 5 feet 6 inches above the floor, those controlling direct radiators being of ornamental design and finished so as to harmonize with the hardwood trimmings in each room. On the fan blast and tempering coils will be placed a thermostatically operated valve on both the steam and the return of each individual section. For the control of these valves and the by-pass dampers thermostats will be located as follows: At the cold-air inlet one set at 40 degrees to operate the valves on the steam and return of the outside section of the tempering coil; one thermostat in the tempered air space at the outlet of the air washer set at 49 degrees to operate the valves on the steam and return connections of the two remaining sections of the tempering coils and one thermostat at the same location to operate the by-pass damper under the tempering coil at 51 degrees.

At the fan outlet one 2-point thermostat will be placed having the first point set at 71 degrees to operate the valves on the outside section of the heating coils and the second point set at 73 degrees to operate the valves on the remaining sections; also there will be a thermostat at the fan outlet set at 75 degrees to operate the by-pass damper under the heating coils.

LOCATING GLOBE AND ANGLE VALVES.

By W. H. Wakeman.

When a steam fitter is about to connect a globe valve on a steam pipe line, he notes the direction in which steam is to flow, then observes the construction of the valve and connects it accordingly. The result as commonly found in practice is illustrated in Fig. 1. This valve is open to about one-quarter of its capacity, and steam is flowing as indicated by the arrows. As steam is travelling comparatively slow, water will collect in front of the valve, as the crooked passage is plainly shown in the illustration. When this valve is opened wide, the resulting rush of steam will carry the water with it, and whether this does any harm or not, depends on what steam is wanted for. In order to overcome this objection, the steam fitter ought to leave the valve stem in a horizontal position, then water will pass through as fast as it comes to the valve. A compromise between two extremes is sometimes adopted, leaving the stem standing at an angle of 45° but this does not give a clear passage for water, and it is objectionable, because it appears very awkward and unsightly, just as if the workman had stopped turning it where he happened to, without making any calculation on the subject.

When a globe valve is put on as shown in the illustration, steam enters under the disk, hence when it is shut, all pressure is removed from the stuffing box, hence the stem can be packed at pleasure. If only a small quantity of steam is wanted it can be throttled to meet the requirements, because all lost motion is taken up automatically. If the disk becomes accidentally detached from the stem, the line can be used, because pressure will force the disk away from the seat. If the valve was connected so that steam would flow in the opposite direction, the above advantages would not be secured.

However, it is possible to find places where better results are secured by having pressure come on top of the disk, with the stem in a vertical position. One of

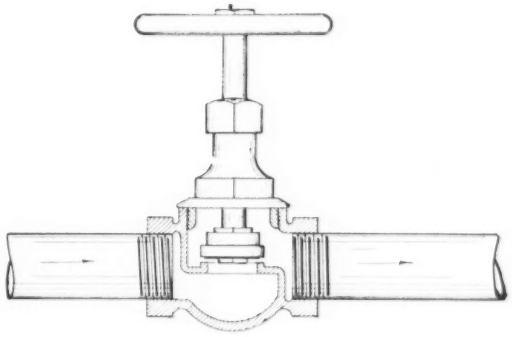


Fig. 1.

these is illustrated in Fig. 2. It shows an auxiliary connection betwen two large pipes, which may properly be termed an emergency pipe and valve. It has never been used although it was installed several years ago. If steam was admitted under the disk on the inlet side, repeated expansions and contractions might lower the hold of the valve on its seat, causing it to leak. In reality steam pressure acts on top of the disk, hence it is always forced to its seat regardless of expansion and contraction. The stem is in a vertical position, but water drains in both directions from this valve, because the connecting pipes are short, leaving free passages into the larger tees.

Fig. 3 illustrates another case where the ordinary rule for locating valves is reversed, with excellent results in practice. The steam plant that I have charge of con-

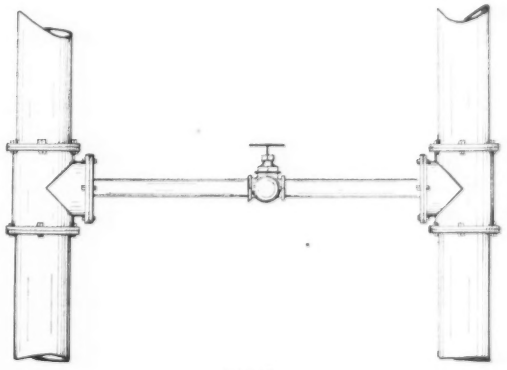


Fig. 2.

tains five water columns, and this is one of them. The upper connection is controlled by an angle valve, and for about 15 years the stem of it was located in a horizontal position. The lower connection was controlled by a cross valve, where the brass tee now is. The drip valve was in the position shown, except that pressure operated under the disk when closed.

These columns were always shut off at night, consequently when the bodies were cooled by the radiation of heat, each disk was loosened, allowing hot water and steam to escape. The heat caused expansion which tightened the valve again, and soon it was not possible

to close the valve tight because small grooves were cut in the seat. The boiler was then laid off, a valve file applied to the seat until it was in good order again, a new disk was put in the holder, giving a new valve for all practical purposes. This process was repeated until it became almost a part of the routine of operation, although it did not come at regular intervals.

I changed the connections of one of these columns until it appeared as shown in the illustration. The angle valve stem was located in a vertical position, and a globe valve was put in the lower connection with its stem placed horizontally. The drip valve was reversed as

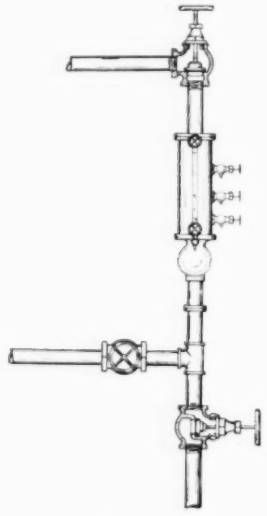


Fig. 3.

shown. Pressure now acts on top of these disks when the valves are closed, hence expansion and contraction have no bad effect on the seats. After using this for several months and finding it satisfactory, I changed the other four to correspond, and am well pleased with the result. In adopting this plan, I disregarded a strong prejudice in favor of always having pressure act on the underside of disks, but old practices should not be retained when the results are not correct.

Steam fitters frequently use the word "seat" when they mean "disk." The former is a part of the body, while the latter is attached loosely to the stem. It was difficult to pack these stems so that they would not leak steam and water, hence as opportunity was presented, each stem was put in a lathe and a light cut taken which made it both round and straight. Since then the packing holds much better.

IRON-WELDING PROCESS USED BY ROMANS.

Methods employed by Romans, during their occupation of England, in welding iron have come to light through recent investigations by British scientists following the discovery of one of the largest masses of Roman wrought iron ever found in England, says "Popular Mechanics." This was unearthed at the site of an ancient Roman town west of the village of Corbridge, on the Tyne. The block of iron was 3 ft. 4 in. long by 7 in. square at one end, which was rough and rather spongy, tapering down to about 4½ in. square at the other end, which was well rounded. It appeared that the block was made by welding together comparatively small lumps of iron produced by a direct reduction process in small charcoal fires. The block was sawed through its entire length and the cut faces planed, polished, photographed and afterward etched with a solution of nitric acid and water and again photographed.

After the faces had been strongly etched, it was easy to trace the lines of welding, not because of the imperfection of the welding, which was generally very good, but on account of the slight physical difference in character of the metal on the sides of the junctions. From these sections it was perfectly clear how the pieces were joined together. In general terms, slabs approximately lenticular in section were employed. After the smaller end was made, the piece at this stage probably had a similar appearance and shape to the upper end of the block in the condition in which it was found in the furnace with projecting taper pieces. After forming the foundation piece, two slabs must have been inserted and the mass then heated to welding temperature after which it was removed and welded by hammering, but by what kind of implements there is no evidence. Step by step this process was repeated until the block of the size and dimensions as described was obtained, plus, of course, the portion which had been removed by subsequent rusting. It seems probable that the block was in course of further development at the time it was left in the furnace.

A Graveyard Episode.

Two fellows had been nutting and on their way home they had to pass a cemetery which was surrounded by a high stone fence. They thought this would be a good place to stop and divide the nuts, so they crawled over this high wall into the cemetery and in doing so they dropped a couple of nuts on the other side of the wall.

They sat down by the wall and opened the sack and began dividing them in two piles. "One for you and one for me! One for you and one for me." And so on. During their division of the nuts an old Irishman passed the cemetery and he thought he heard voices inside so he quietly sneaked up to the stone wall and sure enough he heard them say, "One for you and one for me. One for you and one for me."

This frightened poor old Pat and he started on a dead run toward home. He met his pal, Mike, on the road, and he said, "O, Mike, just as I was coming past the cemetery I heard the Lord and the devil dividing up the dead." Mike said, "Begorry, Pat, you're either drinking too hard or you're dreaming."

"No, sor," said Pat, "come along and hear it wid your own ears." So they went back and crawled up close to the wall and the two fellows were still dividing their nuts, "One for you and one for me. One for you and one for me," and as they got to the last nut in the sack one of them said: "What shall we do with the two on the other side of the fence?"

To this Pat and Mike jumped up and ran like deers and Pat said, "Now didn't I tell ye so?"—The Gimlet.

INTERESTING ARTICLE ON COUNTRY HOME HEATING.

"Heating the Country House Properly," is the title of an interesting article in the October number of "Suburban Life." This publication has been running a series of articles for some months past on different aspects of plumbing, heating, lighting, and sanitation, particularly related to country work. This particular article furnishes a number of interesting comparisons of the steam, hot water and vapor methods, giving advantages of each.

An Analysis of the Plumbing Codes of Thirty-Seven Cities

By Thomes S. Ainge, Sanitary Engineer, Lansing, Michigan

(*Continued from August 3rd Issue*)

SUBSOIL AND SURFACE DRAINAGE.

The specifications relative to Subsoil and Surface Drainage are shown in Exhibit XII., on subsequent pages.

Subsoil Drains.

Inasmuch as the healthfulness of a building will depend, to a large extent, upon the absence from the subsoil of dampness and foul air, the importance of the proper removal of the ground water and the prevention of the escape into the subsoil of sewer air will be apparent. Nevertheless, sixteen of the codes under consideration contain no direct specifications relative to these points.

Where the subsoil drains are connected with the sewer system, even with the best installations, there will, sooner or later, be a possibility of flooding of the subsoil by sewage and a further possibility of the subsoil becoming charged with sewer air. For these reasons, it is well, wherever practicable, to cause the ground water to pass into a drain which is used for the conveyance of storm water only, and this is made obligatory by the specifications of one of the codes.

Where the quantity of ground water is not excessive, it may be allowed to flow into a proper sump from which it can be raised to the surface by hand or by means of a pump. The specifications of four of the codes require this method of disposal wherever the same is possible.

Where the contour of the ground is favorable, it is sometimes possible to discharge the ground water, by gravity, upon the surface of the ground within a reasonable distance from the building, but this method is not mentioned in any of the codes.

In one code, the requirement is made that the ground water be first discharged into the rain water drains—which have a separate main trap and connection with the main sewer—and while this arrangement might be considered to minimize the possibility of the entrance to the subsoil of sewer air, the danger from flooding of the subsoil by sewage in case of a stoppage of backwatering in the sewer would not be entirely removed.

Where the subsoil drains must be connected with the sewer, a catch-basin or, as it is sometimes designated, sump or receiving basin, for preventing the entrance to the sewer of solids, is usually provided at the point of connection, but this arrangement is specified in but eleven of the codes. The water-tightness and durability of these basins is a very important feature, and the nature of the materials of which they are to be made and the methods of construction should, therefore, be specified, but this has been done in but a very few of the codes.

As previously indicated, the trapping of the subsoil drains is a very important requirement, but this is specified in but eleven of the codes. In three other codes, the requirement of a back-pressure trap, or similar device, may have been intended to cover the trapping. In many of the codes which specify a trap for these drains, the nature of the trap is not mentioned, but the general provisions of certain of the codes in regard to traps may have been intended to cover this point. No better form of trap for this purpose can be found than that which is obtained by the use of a bend or elbow at the outlet of the basin, the same to be turned down to within a short distance of the bottom of the basin and provided at the bend with an access opening, and this form of trap is specified in a few of the codes.

Unless the subsoil is constantly wet, so that a sufficient amount of water will pass into the subsoil drains to maintain the water seal of the traps at the proper level, provision must be made to replace the water which would pass from the trap by evaporation, but this is specified in but six of the codes.

Where the subsoil drains are connected with any part of the sewerage system, in the absence of a proper back-water trap or valve, a stoppage or back-watering in the sewer would, ordinarily, result in the flooding of the subsoil with sewage. For this reason, every code should contain specifications relative to this subject, but they are found in but ten of the codes under consideration.

Where a main trap is provided in the sewer into which the subsoil drains discharge, for the better protection of the latter against the entrance of sewer air, it is desirable that the connection of these drains with the sewer be made at some point inside the main trap, preferably in the basement, and this provision is found in the specifications of one of the codes.

It frequently happens that the house sewer is too low to permit of the proper removal of ground water, and, in such cases, provision must be made for raising the water from a water-tight sump to some point where it can be discharged into the opening of a properly trapped sink or onto the surface of the ground, but such specifications are found in but two of the codes.

Yard, Area, and Other Surface Drains Outside the Building. (See Also "Floor Drains in General.")

But eleven of the codes contain direct specifications, more or less complete, relative to the drainage of yards, areas, light and air wells or shafts, and other paved surfaces on the outside of buildings.

In the absence of special precautions, yard and area drains, and other surface drains which are located outside of a building, are soon rendered useless by clogging, by evaporation of the water in the traps, or by frost, and they are frequently found to be acting as ventilators for the sewer, often in close proximity to doors and windows, and to other places where people pass to and fro. For these reasons, wherever possible, such surface water should be made to discharge into drains provided for the conveyance of storm water only or, where the surface contour is favorable, into surface channels or gutters. Where nothing but the rainfall is to be taken care of, and the subsoil is sufficiently porous, these drains may, very properly, be made to discharge into the subsoil at a proper distance from the building and at a safe distance from any source of water supply. These methods of disposing of the surface water are specified in but a very few of the codes as follows:

One code specifies that surface water shall be discharged on the street or alley.

Two codes specify that area drains are not to be connected with house drains unless absolutely necessary.

Three codes specify that surface drains be connected

EXHIBIT XII—SUBSOIL AND SURFACE DRAINAGE

LIST OF THE CITIES AND THEIR INDEX NUMBERS.

Every number in this exhibit in bold-faced type stands for a city and shows that the specification after which it appears applies in that city. Thus 4 stands for Chicago; 32 for Syracuse, and so on.

1. Baltmore, Md.
2. Boston, Mass.
3. Buffalo, N. Y.
4. Chicago, Ill.
5. Denver, Col.
6. Detroit, Mich.
7. Fall River, Mass.
8. Indianapolis, Ind.
9. Jersey City, N. J.
10. Kansas City, Mo.
11. Los Angeles, Cal.
12. Louisville, Ky.
13. Memphis, Tenn.
14. Milwaukee, Wis.
15. Minneapolis, Minn.
16. Newark, N. J.
17. New Haven, Conn.
18. New Orleans, La.
19. New York, N. Y.
20. Ohio State Building Code, governing the cities of Cincinnati, Cleveland, Columbus and Toledo, O.
21. Omaha, Neb.
22. Paterson, N. J.
23. Pennsylvania State Plumbing Code, governing the cities of Pittsburg and Scranton, Pa.
24. Philadelphia, Pa.
25. Providence, R. I.
26. Rochester, N. Y.
27. St. Joseph, Mo.
28. St. Louis, Mo.
29. St. Paul, Minn.
30. San Francisco, Cal.
31. Syracuse, N. Y.
32. Washington, D. C.
33. Worcester, Mass.

Subsoil Drains.

No direct specifications.—**2-3-5-10-11-12-13-14-15-17-18-21-22-25-27-31.**

To be connected with a separate system of drains for the removal of rain water only.—**30.**

To discharge into rain water system which has separate main trap and connection with the sewer.—**6.**

To discharge first into catch-basin, sump, or receiving basin.—**1-8-9-16-19-21-23-24-26-28-29.**

Where possible, catch-basin not to have connection with sewer and provision to be made for lifting or otherwise discharging the water therefrom to a point above the cellar floor.—**16-19-23-32.**

Trap to be provided in catch-basin, etc., at some point in the drain.—**7-8-9-19-20-21-23-24-29-32-33.**

Provision to be made for maintaining the water seal of the trap through or into which the ground water flows or is discharged.—**7-16-19-20-23-24.**

To be protected against back-flooding by flap valve, back-pressure trap, back-water valve, or other suitable device.—**1-9-19-20-23-24-26a-28-29-32.**

Connection with sewer to be made inside the fresh-air inlet.—**28.**

Where drains are below the sewer, provision to be made for raising the water to the proper height.—**4-24.**

Yard, Area and other Surface Drains Outside of Buildings. (See also "Floor Drains in General.")

No direct specifications.—**2-5-7-8-12-17-18-27-28-31-33.**

To discharge on street or alley.—**13.**

Not to be connected with house drain unless absolutely necessary.—**16b-22b.**

To be connected with rain water drains.—**3b-10bc-30.**

To be connected with sewer outside of house drain connection.—**20b.**

Yards, areas and Courts of over 15 sq. ft. in area must be drained into sewer.—**19.**

Shafts, open at the top, not exceeding 25 sq. ft. in area, which cannot be connected in back of leader, yard, court, or area drain trap, may be drained into a publicly-placed, water-supplied, properly trapped and vented slop sink.—**19.**

Where practicable, to connect with house drain inside of main trap.—**3b-26.**

Size of drain specified.—**11-19-20i-22-23-24b-32i.**

Catch-basin to be provided.—**11-14d-15g-20j-21-24-25.**

Dry cesspools to be used for areas where practicable.—**16.**

Inlet to have perforated cover.—**10-13g-19.**

To be trapped.—**1-3-4-10-13g-15g-16-19k-20-23k-24k-25-26k.**

Depth of water seal of trap specified.—**11.**

Traps to be set out of the reach of frost.—**1-4-10.**

Traps to be ventilated.—**10e-20j-21.**

Provision to be made for maintaining the proper water seal of traps.—**1-16b-22.**

Traps to have access openings.—**16-19-22.**

Bell traps prohibited.—**10.**

Bell traps apparently permitted without restriction.—**6.**

Bell traps permitted when set over another trap.—**1-8-9f.**

Iron running traps specified for yards and areas.—**16-19-22.**

Back-pressure traps or valves to be provided.—**13g-14-15g-16-25.**

Cellar Drains. (See also "Floor Drains in General.")

No direct specifications.—**5-9-12-17-18-20-21.**

All cellars to be provided with.—**26.**

In building used for mercantile or manufacturing purposes, where a sewer is available, there shall be a connection in the floor of basement which can be opened immediately for purpose of drainage in case of flooding, and the location of this opening shall be indicated by a conspicuous and permanent sign on the wall near to ceiling.—**28.**

Not allowed without special permission.—**7.**

Not to be connected with sewer without permission.—**26.**

Not to be connected with subsoil or soil drain.—**6.**

Not to be connected with soil drain unless absolutely necessary.—**16-22.**

Permitted only where general drainage system is properly ventilated.—**24.**

To be connected with rain water drain.—**6-30**

To be connected, where practicable, with storm water sewer—**26.**

Dry cesspool to be used where practicable.—**16.**

Not to be connected with 4 in. pipes which serve a closet, but with a 5 in. or 6 in. drain, or directly with main drain.—**3.**

May be connected in back of and controlled by a leader, yard, court, or area drain trap which need not be vented.—**19.**

May be connected, through a back-water valve, directly with fresh-air vent or surface water sewer.—**33.**

Size of drain or trap specified.—**3-11-22-26-32.**

To have catch-basin.—**11-14-25.**

To be trapped.—**1-2-3-4-6-11-13-15-16-19-22-24-25-26-27.**

Running trap specified.—**16-22.**

Bell traps prohibited.—**4-15.**

Bell traps apparently permitted without restrictions.—**6.**

Bell traps permitted when set over another trap.—**1-8-27m.**

Traps having covers over sewer side held in place by lugs or bolts prohibited.—**4-15.**

Traps having seal dependent upon removable part prohibited.—**27.**

Traps having interior partitions or mechanical seals prohibited.—**151.**

Provision to be made for permanent water seals of traps.—**1-16-19-22-23-24-26.**

Depth of water seal of traps specified.—**11-15.**

Traps to be ventilated.—**13-27.**

Traps to be set out of the reach of frost.—**1.**

Traps to have access openings.—**15-22-25-29.**

Cleanout openings not allowed.—**26.**

To have back-water valve or trap.—**2-4-15a-16-24-25-27-33.**

EXHIBIT XII.—SUBSOIL AND SURFACE DRAINAGE.—CONCLUDED.

To have screw plug inlet where permanent water seal cannot be obtained.—**26.**

Where too low to be drained into sewer, provision to be made for raising the water from a sump to the proper height.—**4-30.**

Floor Drains in General.

No direct specifications.—**2-3-5-7-9-11-12-14-16-17-18-22-25-26-31-33.**

Not permitted unless absolutely necessary.—**1-19-23.**

To empty into open sink properly trapped and vented. —**13-20.**

Size of trap or drain specified.—**240.**

To be trapped.—**1-4-15-21-27-30.**

Bell traps prohibited.—**4-30.**

Bell traps permitted when set above another trap.—**8-21-27m.**

Traps having cover over sewer side held in place by lugs or bolts prohibited.—**4.**

Traps having seals dependent upon removable part not permitted.—**27.**

Traps to have suitable strainers.—**30.**

Traps to have permanent water seals.—**1-19-21-23-30.**

Traps to be ventilated.—**21n-27-30p.**

Revent under Bell traps not required.—**23.**

Traps to have access openings.—**29.**

Traps for showers to be vented, unless located in cellar or ground floor the paving of which renders the trap inaccessible. For two or more showers, the waste line must be loop vented instead of venting each trap.—**23-32.**

Traps to be not more than 4 ft. and not less than 2 ft., in a horizontal line, from floor drains.—**21.**

Traps not to be connected closer than 2 ft. from vertical stacks and to the sewer side of stacks. Outlet from floor drain to be at least 4 ft. above inlet to drainage system.—**10.**

To have back-water trap or valve.—**4-15-23-27.**

Urinal wastes not to act as feed for any floor drain. —**30.**

Drains from packing houses, and all such places from which objectionable matters might enter the sewers, to have intervening catch-basins.—**28.**

Foot Notes.

a. When required by Inspector.
b. Refers to area drains only.
c. When not practicable to connect with interior system of drainage.
d. Catch-basins for areas to be inside building.
e. Refers to light shafts when connected with plumbing system.
f. To have vent between the two traps.
g. Refers to buggy washstands, carriage wash, or wash rack, only.
h. Refers to barn, stable and yard drains, only.
i. Refers to yard drains, only.
j. Refers to stable drains, only.
k. Leader trap, if possible.
l. Except in case of brass interior partitions at least ¼ inch thick.
m. Bell to be removed from trap.
n. Vent to be not more than 18 inches from trap.
o. For iron traps.
p. Urinal and water closet floor drains.
q. In connection with any apparatus used for lifting the ground water to the sewer level.

with the rain water drains, but two of these have reference to area drains only, and in one of these the exception is made that, when this method of disposal is not practicable, the area drains must be connected with the interior system of drainage—a very good arrangement for protection against frost, provided the installation is properly carried out and the trap protected against loss of seal.

One code specifies that areas be drained into dry cesspools wherever practicable.

Where the surface drains must be connected with the sewer, and there is a main trap in the latter, the connection should be made at some point inside the main trap, and this is specified in two of the codes, in one of which, however, reference is made to area drains only. This arrangement will afford additional protection against the passage of air from the public sewer through the grade openings at such times as the water seals of the traps might be lowered to the breaking point.

The sizes of surface drains are specified in but seven of the codes, but, in certain of these, this point may have been intended to be covered by the general specifications relative to the sizes of the branches of the main drain.

As in the case of subsoil drains, it is highly important that provision be made for intercepting the solid matters which would be likely to pass into the drains of yards and areas, but this provision is found in but seven of the codes, and, in two of these, the specifications have reference to barn or stable drainage only.

That every surface drain should have a strainer at the inlet goes without saying, and this is probably the reason for the omission of this requirement from all but three of the codes, in one of which reference is made to the drains from buggy or carriage washes only.

The necessity for the trapping of surface drains is recognized in thirteen of the codes, but the specifications of two of these have reference to buggy or carriage washstands only, and four others specify that wherever possible, the leader trap be used for this purpose.

Depth of water seals of the traps of such drains is a matter of no small importance, but is mentioned in but one of the codes.

Another important matter, which seems to have escaped attention at the hands of the framers of all but three of the codes, is the placing of the traps of these drains out of the reach of frost. As three of the codes specify the use of running traps for this purpose, it may have been assumed that these would be placed out of the reach of frost anyway.

Still another important matter which seems to have been overlooked in all but three codes is the provision for the maintenance of the water seals of the traps, and in one of these, the specifications have reference to the traps of area drains only.

It is usually difficult and frequently unnecessary to back vent the traps of surface drains, nevertheless this requirement is found in three of the codes. It would be a wise precaution in cases where there is a possibility of the water seals of the traps being reduced or broken by siphonic action, but this danger can usually be overcome by the use of an anti-siphon trap of suitable form and size.

Notwithstanding the provision of strainers and catch-basins, the traps of surface drains may, sooner or later, become choked by dirt and other solid matters, and as these traps should, very properly, be placed out of the reach of frost and would, therefore, be out of sight and ordinary reach, they should be provided with means of access manholes if necessary. This requirement is found, however, in but three of the codes.

In the choice of a trap for a surface drain, in the past, the Bell trap, or as it is frequently designated "Cesspool," seems to have been the most popular, notwithstanding the fact that it is the most unsuitable for these or any other kind of drains. It is, therefore, gratifying to note that, in a few of the codes, its use has been hedged around with restrictions and, in one, prohibited entirely. Three codes permit their use only when set over or near to another trap, indicating that the Bell trap is intended

to serve the purpose of a strainer rather than that of a trap. This arrangement is entirely unnecessary and detrimental to the proper working of the drains, and for the following reasons:

The cover of the trap is easily clogged with a small amount of solid matter, a piece of paper, a few leaves, etc., and is, therefore, unsuitable for a strainer.

The small space between the underside of the bell and the standing outlet of the trap tends to a rapid collection of solid matter in the trap at this point, thus causing frequent stoppages.

When stoppages occur, the cover must be raised and is generally left off, thus depriving the trap of its strainer.

The covers are fragile and the usefulness soon ended, particularly if left lying around on the ground, as is frequently the case.

The air lock which is formed between the two traps, together with the smallness of the passage through the Bell trap, tend to a sluggish flow of water through the latter and render it necessary to remove the cover at such times as there is any considerable quantity of water to be removed.

In short, there is not one redeeming feature in a Bell trap and their use should be absolutely prohibited.

The use of a back-pressure trap or valve in connection with a surface drain is specified in five codes, two of which have reference to the drains from buggy or carriage washstands only. Under certain conditions, this precaution might be necessary in regard to drains which are on, or nearly on, a level with the basement floor, but it would scarcely be necessary in the case of yard drains which are usually laid at a much higher level than the sewer.

Cellar Drains. (See Also "Floor Drains in General.")

Where a considerable amount of water is to be taken care of, the use of an open drain in a cellar may be justifiable, but where the quantity of water will be limited to occasional seepage, or to floor washings at irregular intervals, such drains may often be dispensed with entirely or the opening to the drain should be sealed with a screw cap or plug.

As a rule, upon examination, the traps of cellar drains through which but little water passes will be found to be dry, or nearly so, or the traps filled with solid matter; and they are frequently found to be acting as outlets for the air of the house drains. For these reasons, the specifications of a plumbing code should be very complete upon this point and made to cover every possible condition. Seven of the codes under consideration contain no direct specifications in regard to these drains, and, in many others, the specifications are very incomplete. In one code, their use in all cellars is made compulsory, while in another code a sealed opening is required for the basements of all buildings used for mercantile or manufacturing purposes which are liable to be flooded at any time. In another code, it is specified that such drains may not be used without special permission, and in one other code, their use is conditional upon the proper ventilation of the drainage system.

As in the case of subsoil and surface drains, wherever possible, the drain of a cellar which is intended to take care of occasional seepage or floor washings should be made to discharge into a system of drains intended for the conveyance of storm water only, onto the surface of the ground, or into the subsoil at a safe distance from the building or from any source of water supply. These methods of disposal are specified or indicated in but a small number of the codes as follows:

Four of the codes prohibit the connection of the cellar drain with the sewerage system,—one absolutely, two in cases where the same is not absolutely necessary, and one where special permission is not first obtained.

Three codes prescribe that the cellar drain be connected with the rain water drains—two in every instance and one wherever practicable.

One code prescribes that, wherever practicable, the cellar drain be made to discharge into a dry cesspool.

The sizes of cellar drains is specified in but five of the codes, but the general specifications of some other codes in regard to the sizes of the branch sewers may have been intended to cover this point.

Cellar floors are, usually, more or less covered with dirt of various kinds, and the provision of catch-basins in connection with these drains is very necessary, yet this requirement is found in but three of the codes.

The necessity for the trapping of cellar drains which have connection with any part of the sewerage system is more generally recognized than many other features in connection with such drains, but more than half of the codes do not contain any specifications upon this point.

Of the light codes which contain some specification relative to the types of traps which may or may not be used in connection with cellar drains, two specify running traps, two prohibit the use of Bell traps entirely, one apparently permits the use of Bell traps without any restrictions, three permit the use of Bell traps when set over or near other traps, two prohibit the use of traps which have covers on the sewer side which are held in place by lugs or bolts, and two prohibit the use of traps having interior partitions or mechanical seals.

Measures for securing the permanency of the water seals of the traps of cellar drains which have connection with a sewer should always be made a pre-requisite for permission to construct such drains, yet this requirement is found in but seven of the codes, one of which requires the use of a screw plug inlet to the drain in cases where this requirement cannot be met. This requirement should also include a minimum depth of water seal, and this is specified in two of the codes.

Two of the codes specify the back-venting of the traps of cellar drains, and as the requirements for the ventilation of these traps are similar to those which should govern the ventilation of the traps of yards and areas, the remarks previously made in reference to the latter will apply here with equal force.

Under ordinary conditions, and with proper installation and care, the traps of cellar drains will not be subject to freezing temperatures, nevertheless, the specifications of one of the codes have been framed to cover such a contingency.

The provision of access openings in cellar drains is a wise proceeding, but is specified in only four of the codes, and in one other code their use is prohibited.

Under certain conditions, the provision of a back-water trap or valve in connection with a cellar drain is necessary and would be a wise proceeding in every case where the drain is not constantly sealed with a screw plug or cap. Eight of the codes contain such a requirement, but in one of these the matter is left to the judgment of the inspector.

Cellars are frequently too low to afford drainage into a sewer and provision must then be made to collect and raise the water which would be likely to accumulate in them to the proper level. This provision has been overlooked in all but two of the codes.

As dirt and, possibly, filth may accumulate in any dark

or hidden portion of a cellar and become a source of nuisance or a danger to health, one of the codes has, very wisely, placed the ban upon covered floor drains in such locations.

Floor Drains in General.

Many of the codes which do not contain direct specifications governing the drains of yards, areas and cellars contain specifications governing floor drains in general. In some respects, this might be considered sufficient, but inasmuch as there are differences in the methods of dealing with the different types of floor drains, separate specifications governing each type should be included in each code, or the same might be grouped under three heads, as in this analysis, viz., "Yard and Area Drains," "Cellar Drains," and "Floor Drains in General."

Sixteen of the codes under consideration do not contain any specifications governing floor drains in general, and the codes which do are pretty well permeated with shortcomings in many important particulars.

As will be seen by reference to the accompanying exhibit, the specifications in the codes governing floor drains in general are very similar to those which govern the drains of yards, areas and cellars, and further comment will not, therefore, be necessary, other than to state that in but a very few of the codes is there any mention of the drains from garages or of the necessity for a trap in connection with these places for the interception of oil, gasoline and other inflammable materials. The Washington, D. C., code covers this point very thoroughly and might be used, with advantage, as a model for amendments to the codes of other cities in this particular.

UPWARD VERSUS DOWNWARD VENTILATION FOR THEATERS.

By D. M. Quay, Cleveland, O. Read at the Summer Meeting of the American Society of Heating and Ventilating Engineers, Held in Detroit, Mich., July 11-13, 1912.

The question of upward or downward ventilation, as a general question, has been discussed from time to time in our meetings, and in the various trade papers, until the question has become threadbare.

Even as applied to theaters the question is not new. The vitiated air being nearest the floor when it is cool would seem to indicate that the vent registers should be placed near the floor to insure satisfactory ventilation.

Whether the upward or downward system is used, there is a great question as to whether the method of bringing the fresh air in through the floor under the seats, using the popular Mushroom distribution is a satisfactory, sanitary method of ventilation.

Let us analyze the question. First, the Mushrooms will **not** prevent the air from lifting the microbes and other foul matter from the floor and distributing them with the incoming fresh air to the breathing lines of the assembly. Second, with this method it is **not** possible to bring air in at a high enough velocity to give any cooling effect in warm weather, without annoying the occupants, especially the women, who are usually attired in light clothes in summer weather. Third, the fresh air brought in by this method, under the seats, which is contaminated by being passed over and through the clothing of the occupants is not always absolutely clean and free from disease germs.

Fourth, the skirts of the women often touch and drag on the floor and pick up impurities that are mixed with the incoming air and carried to the breathing line, when the Mushroom method of delivery is used.

Fifth, the air is often contaminated with disease from the respiration of those infected.

Sixth, the clothing of the assembly, especially of the women, holds the incoming air under the seats and interferes with its proper distribution and circulation, thereby causing it to become still more impure before reaching the breathing line.

Taking all these things into consideration, there seems to be no good reason for using the Mushroom method, or any other method of bringing the fresh air into assembly rooms under the seats where it will become so thoroughly contaminated before reaching the breathing line of the audience.

The system should be reversed and the foul air taken out under the seats, and the occupants provided with fresh air from above the breathing line. The outlets should be large enough to remove at least 30 cu. ft. per min. per occupant, without any objectionable draft.

Provision should be made for bringing in the same amount of fresh tempered air in cool weather and cooled air in warm weather. Provision should also be made for washing and cleaning the incoming air.

I am fully aware that this Mushroom method of supplying the fresh air to theaters and auditoriums is quite popular and has been recommended by a number of prominent ventilating engineers. I am convinced, however, that the objections to this system have not been given very careful consideration, or the system would not be in such general use.

We cannot afford, as engineers, to advocate any particular system because of its popularity.

If this system was the only one system that could be satisfactorily used for theater and auditorium ventilation, there might be some excuse for using it in the face of the objections indicated, but the downward system of bringing air in at the proper distance above the audience, and taking it out under the seats referred to, has been extensively used, and the best results have been obtained from its use, so that it is entirely beyond the experimental stage, and overcomes all the objections to the Mushroom method referred to.

It is claimed by some that the fresh air cannot be delivered to the main auditorium, especially over the central part, without objectionable draft. But this is not the case, where the exhaust outlets are placed under the seats, that is reversing the Mushroom inlet method, or by placing exhaust registers in the risers where strips are used in the raised floor, as is often the case in balconies and galleries.

When the foul air is removed from the central and other parts of the assembly room, the fresh air will readily come in to take the place of the foul air displaced.

Fer Warmin'.

Now the radiator's spittin',
Where the back-log used to crack,
But I'm gettin' warm while sittin',
Without a draft along my back.

Where the kettle once was singin',
A humidifier's at rest,
And the air's not quite so stingin',
As I draw it in my chest.

There was cheer around the wood grate,
With its friendly smilin' gleam,
But fer warmin' up, I'd hesitate
To choose it over steam.

Michigan Farm Paper Editor Turned Plumbing Advisor

Calls the Plumber a "Plunderer" and Advises His Readers to Buy and Install Their Own Water Systems and Plumbing Jobs, and Save "Exhorbitant" Costs.

OUR very good friend Grant Slocum, of Detroit, is editor of Michigan's leading agricultural monthly magazine, "The Gleaner." Mr. Slocum has been a power for good among Michigan farmers—his vigorous espousal of the cause of good farming and right living has without doubt brought a good measure of additional prosperity to his readers.

Mr. Slocum does not claim to be a practical plumber, nor does he hold any degrees as Professor of Plumbing in any of our colleges. Much of his experience has been in the purchase of plumbing for his new country home up north of the City of the Straits—and he is satisfied that no plumbing contractor ever did better work for any one.

For several months past he has devoted several pages of his paper to articles on the septic tank system for the country home, the individual water system on the farm, and more recently the matter of sanitary plumbing for use with these. His suggestions and arguments for the installation of these conveniences are logical, and will undoubtedly bear good fruit.

However, in the October number he undertakes to teach his readers, of whom the majority are farmers, just how to buy and install the entire plumbing equipment for the home. He proceeds to take a rap at the invisible plumber, and without showing the reason for his animosity, he proceeds to instruct his readers in "money-saving" methods. Perhaps he has not yet realized that true sanitation is of necessity associated with competent workmanship. But read what he says:

"The Plundering Plumber."

In closing my article last month on "Home Water Works," I promised this month to have something to say about plumbing and the "plunderer." The actual cost of equipment for your home—a bathtub, lavatory, flush-closet, kitchen-sink and hot-water boiler—will range from $36.00 to $60.00. You can pay more, of course, but I know of three reliable firms that will furnish you with the outfit enumerated at the prices named, and you will find the equipment satisfactory in every way. You figure that you can afford the equipment, and go to your local plumber and ask him for a price on installing the outfit. Right here is where you get your first set-back, where you find the reason why the plumber is in reality a "plunderer." He will first tell you that the outfit you propose to purchase is "no good—too cheap." Then he will proceed to show you the "real thing," which he handles. For remember, every plumber, whether he has a store or not, is on to the wholesale price game, and as an agent he receives commissions ranging from forty to eighty per cent. I know from actual experience that there is more genuine graft in the plumbing business than in any other that enters into home building—and gracious knows, there is enough all along the line. Next this "plunderer" will talk learnedly about "traps, wiped joints and sewer gas," and finally give a figure on installation which will "floor" you. You will at once say you can't afford these simple necessities, which would mean so much in pleasure, comfort and health if installed in your home.

I believe it was made clear in previous articles on home building that the sewage problem could be solved by any farmer; if not, a personal letter will bring you full information. With this problem solved, the rest is easy. There is nothing, absolutely nothing, mysterious or difficult about plumbing. The plumber must surround his profession with an air of mystery in order to secure unreasonable prices for his labor, and he has well earned the reputation of being the biggest professional grafter on the job. True, there are many reliable plumbers—I secured the services of such—but the ratio is about eighty-nine "plunderers" to eleven honest plumbers.

Of all the people who need the conveniences mentioned most, the farmer stands at the head. How a good bath at the close of a hot day in the dusty field would rest his tired body. How the hard working housewife would appreciate the sink with its system of caring for sewage; and hot and cold water from the faucets right at hand; the bath room, the flush-closet—all present day necessities and luxuries now enjoyed by every workingman's wife in our cities. Her work is hard enough, God knows. She should not be required to toil day after day in the farm home tread-mill without these little conveniences now within the reach of every farmer. Brother, you have many times given your note in payment for a self-binder or other implement for use upon your farm, but you hesitate when your wife suggests that she should have some of the conveniences her village sisters enjoy. This is not right, and you know it. Some day you will appreciate what mother is doing and has done on the old farm—God grant that you realize her partnership with you long before she is summoned to the other home in the Great Beyond.

You can afford to install these conveniences in your home, because you can do the work yourself, and this fall would be a mighty good time to do it. Now for just a little talk on the subject of plumbing, that we may simply get at the fundamentals:

The object of plumbing is to provide a sanitary means of disposal for waste water and sewage from dwelling houses to some distant point where it can be properly decomposed or carried away, and to provide a substantial means for supplying running water to various fixtures in the building. Every plumbing job may therefore be divided into two sections, the waste piping system and the supply piping system. To simplify matters we will take these up separately: First: The Waste Piping System. It is a well established rule in mechanics that the simpler a machine is designed and the fewer working parts it has to accomplish a given result, the nearer it approaches perfection. The sole purpose of the waste piping system is to carry away the waste water in a sanitary manner. As it vitally concerns the health of every individual in the household it is by far the most important. If it were merely a matter of disposing of the waste water the piping could be very simply arranged, but there is more than this to be considered. The system must be so planned that there will always be a water seal between the sewer or cesspool and the fixtures, so that the poisonous sewer gases cannot find their way back through the piping and into the living rooms. This is accomplished by means of what is called a trap, a fixture in plumbing which probably 90 per cent of the people outside of the plumbing trade are thoroughly familiar with. For the

benefit of the remaining 10 per cent, however, who have not given this matter any thought, we will explain.

Suppose you would connect a kitchen sink or other fixture to a sewer or cesspool with a straight piece of pipe, as shown in Fig. 1. There would be nothing here to prevent any sewer gases which would develop from rising right up through this pipe as they would through a chimney and fill the room. Suppose, further, however, that you would make a bend in this pipe, as shown in Fig. 2. In this case as soon as any water was poured into the sink the crook in this pipe at A would become immediately filled with water and would remain so even after all of the water had been drained out of the sink, provided the water had not been poured in so fast that the suction action was sufficient to draw the water out of this goose neck or trap, as it is commonly called. Here, then, is the solution of the problem: By placing a trap or a water seal on this line between the plumbing fixture and the sewer, these gases can be prevented from circulating up into the rooms.

There is one other point in this connection, however, which is so surprisingly simple that it is really wonderful to think of the complicated arrangements and indirect methods which plumbers use to provide for it. The point we refer to is ventilation, as the term is used in connection with plumbing. The purpose of this is to break the suction action in the trap which always takes place when a large quantity of water is passing through and to provide a ready means for the escape of any sewer gas which might develop at a pressure strong enough to force itself up through the water seal of the trap.

Have you ever tried the experiment of filling a rubber tube with water and placing one end in a vessel of water, letting the other end hang down as shown in Fig. 3? You would find that the water would run up through the tube over the side of the vessel, and the entire vessel could be drained in this manner. This is the principle of the syphon and it is this same principle which operates when the water seal of the trap is entirely drawn out by the suction of the water.

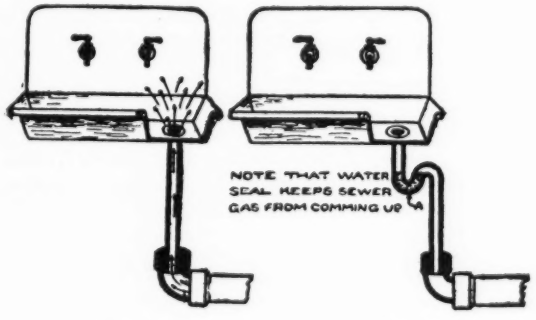


Fig. 1. Fig. 2.

Suppose, however, that you punctured a small hole in the tube at the point A. Air would immediately enter the tube and the suction action would stop at once. This is therefore the preventative: provide an entrance for air in the trap and it cannot syphon out. We accomplish this by carrying a main soil pipe stack from the ground line to the roof of the building and connecting the fixtures directly to it. The purpose of the soil pipe stack is to provide air to the various traps so that the seals can never be drawn out by the suction.

By referring to Fig. 4, which shows the standard method of connecting a closet on the second floor and a sink on the first floor with the soil pipe stack, it will be seen that these fixtures are connected directly into the stack as it passes up through the roof, and on examining this diagram carefully it will be seen that the water after it leaves the goose-neck in the sink trap has no vertical fall until it reaches the soil pipe stack.

It is the vertical fall of the water which produces the suction action, and if it is desired to break this suction action in a trap, air must be supplied before the water

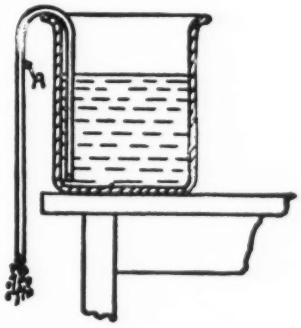


Fig. 3.

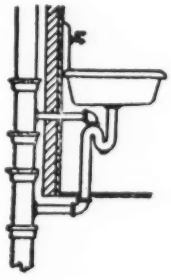


Fig. 5.

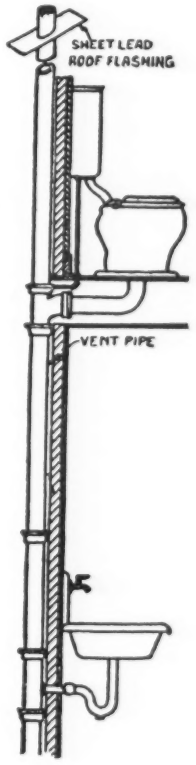


Fig. 4.

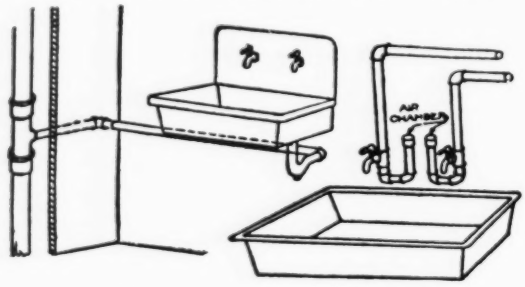
starts to turn downward. It will be seen clearly in Fig. 4 that the water does not turn downward until it reaches the soil pipe stack, and when it reaches this point and does turn downward, instead of drawing the water seal out of the trap, it will draw air from the top of the stack and the seal in the trap will not be disturbed.

The trap shown on the sink in Fig. 4 is called a "P" trap, and when a trap of this kind is connected directly into the soil pipe stack as shown, there is no need whatever of further venting it, as is sometimes done by plumbers who do not understand the real principles involved.

Fig. 5 shows how the connections should be properly made in the case of an "S" trap. A trap of this kind should always be vented whether used on a sink, lavatory or any other fixture. As before explained, it is the downward turn of the water which really produces the suction action, and as the water turns downward for a considerable distance in a trap of this kind before reaching the stack, where it can draw in air, the trap could easily be syphoned out if not provided with a short cut for the air to reach the trap and break the suction action before the water turned downward. The proper place to vent an "S" trap is therefore on the top as shown. Then as soon as the water starts to turn downward any suction action will draw air in through the vent pipe instead of drawing the water out of the trap. We avoid

as much as possible the use of "S" traps on sinks, and it is always preferable to use a "P" trap and connect the sink directly in front of the soil pipe stack. In cases where the sink cannot be located directly in front of the soil pipe stack, so that a short, direct connection can be made as shown in Fig. 4, there are two alternatives:

First, a "P" trap can be used, pointing same toward the wall and making connection between the trap and stack with a horizontal pipe connection as shown in Fig. 6. Be careful not to give this pipe any perceptible pitch, so that there will be no vertical drop until it reaches the



F'g. 6. Fig. 7.

soil pipe stack, otherwise, provided the pitch was great enough, the trap would be syphoned out. If this scheme is followed and a "P" trap is used as above explained there will be no need of a separate vent stack for the sink. These general principles cover practically all there is to the waste piping system of any ordinary plumbing job.

It now remains for us to discuss the second section of the system, i. e., the Supply Piping System. This is absolutely so simple that there are very few principles to be explained. It is simply a matter of running the proper size pipe from the source of water supply to the various fixtures to be supplied in the most simple manner possible. In fact, there is only one point in connection with this part of the system that requires any explanation whatever, and that is the purpose and proper use of air chambers.

An air chamber in a section of the piping in which air is retained so as to provide a cushion when the water is suddenly turned off. When water is allowed to run very fast and is suddenly turned off there is produced a sudden thud in the piping which would very soon put the faucets out of order were there not some sort of cushion to stop the force. This is the purpose of the air chamber. By referring to Fig. 7 you will see where this is commonly placed on the sink connections.

There is no use in going into further details; sufficient has been said to give you the fundamental principles of plumbing. If you have made up your mind to install a system in your home, write me. I can put you next to firms that will figure your job, cut your pipes and furnish you the few simple tools necessary to install the outfit. You can be independent on this proposition, and I will prove it to you, if given a chance. Just a final word. Many farmers argue that because they didn't install the plant when building, they are now going to be handicapped. Such is not the case. Open plumbing is now preferred by many builders, and the necessary piping will in no way injure or interfere with the appearance of your farm home.

Now, Mr. Slocum's interest in the matter must certainly be impartial, for surely he does not intend to embark in the plumbing business himself. He is also aware that if any fair proportion of Michigan farmers decided at once to install plumbing fixtures and water systems, the eight hundred or more Michigan plumbing establishments would be so thoroughly swamped that they would hardly see daylight all season.

No, such would not be the result of his suggestions. But what **would** be the result if the farmers were to undertake this work themselves? And how much would they save by it?

Yes, some concerns are selling "complete plumbing outfis" to the consumers for $39.99 and other such "reasonable" figures. And to the uninitiated this seems a real bargain. But the buyer is only getting his eye-teeth cut with the first order. This really bargain proposition takes on a different look when the balance of the material for the job is finally gotten on the ground.

And the installation! Examples of amateur plumbing jobs are frequent enough to make further comment unnecessary. The wonder is that Mr. Slocum should steer his readers up against something that is so sure to prove a boomerang to him.

The "plundering plumber!" It doesn't take an extended examination of Dun's report to show that Michigan plumbers are to an astonishing extent more prosperous than others over the country. Now are the trade as a whole more liberal in the purchase of expensive automobiles than are the bankers, or the owners of farm papers?

You plumbers who have made such a fortune from the farmers on their water supply and plumbing jobs, speak up. Let us know how you did it. There are many others in the trade who would like to know the secret.

In the meantime, if Mr. Slocum's articles have aroused in the minds of the farmers a desire for the conveniences of home plumbing, he has to that extent done good. And let us hope that a few of these new jobs, at least, will be added to the plumbers' orders. For what farmer wants to be a plumber, anyway?

PRESIDENT FRANK J. FEE APPOINTS BOARD OF DIRECTORS.

Frank J. Fee, president of the National Association of Master Plumbers, has appointed the following members of his Board of Directors for the current year: A. C. Eynon, 236 North Walnut street, Canton, Ohio; W. H. Halsey, 432 Jefferson street, Milwaukee, Wis.; John Trainor, 877 North Howard street, Baltimore, Md.; Jeremiah Sheehan, 1012 Locust street, St. Louis, Mo.; F. H. Gawthorp, 104 West Fourth street, Wilmington, Del.; Isaac J. Brown, 239 Fourth avenue, New York City; S. Louis Barnes, 2104 North Sixth street, Philadelphia, Pa.; Robert E. Quinn, 9 Fair street, Paterson, N. J.; Carl J. Stein, 853 South State street, Chicago, Ill.; Robert J. Welch, 61 Middle street, Lowell, Mass., and Thomas Haverty, 517 Los Angeles street, Los Angeles, Cal. In addition to the foregoing the officers of the association are also members of the board.

Rome, N. Y.—Chas. E. Williams, who engaged in the plumbing business here at 200 West Liberty Street last May, reports splendid progress. He is desirous of receiving catalogues and discount sheets from manufacturers and jobbers of plumbing material.

Cleveland, O.—The Cleveland Sanitary Plumbing & Heating Co. has recently been incorporated to engage in a general plumbing, fixture and heating apparatus business. The incorporators are: J. C. Foster, J. W. Pulford, John E. Ordell, William S. Gilbert and George H. Bellman.

THE USE OF THE WASTE BASKET.

Some plumbers and fitters use the conventional wire or fibre waste basket—others a box or barrel, still others a convenient place back of the pipe rack.

But the waste-basket habit with a man over in Iowa became so fixed that he sent to a mail order house and secured the tallest and widest basket he could get. Then he dumped into it, promiscuously, without opening, every unsealed envelope, package and folder that the kind thoughts of the manufacturers had directed to him. Even the notice of the expiration of his subscription to his favorite trade paper in some way got into this same basket.

One day a manufacturer's salesman came along—his line was one in which this same plumber was really interested. No he hadn't seen the literature, the improvements made recently were not familiar to him. He always bought when his jobbers salesman came along, and so on.

A little conversation brought forth the fact that within that waste basket reposed at one time or another all of the catalogs, circulars and letters that this manufacturer had sent him—unopened, unnoticed, the manufacturer's name and address hardly noted.

Yes, this plumber bought from his jobber. But how was he to show to his prospective customer pictures, and descriptions of the newest and most attractive plumbing and heating materials? How were his customers to select the very newest wrinkles in the market? How, indeed, was the plumber to further his reputation as headquarters for the most up-to-date lines that his customers could use? He could hardly expect the supply man to be a walking, illustrated encyclopedia.

No matter from whom he bought, this plumber was neglecting opportunities for his own financial betterment, by ignoring the real vital money-making information that would mean for him the sale of higher priced or more attractive goods.

The profit in the plumbing and heating business can be better figured on material than labor.

A. S. I. P. & S. E. REPRESENTED AT CONVENTION CONGRESS IN INDIANAPOLIS.

The American Society of Inspectors of Plumbing and Sanitary Engineers was well represented at the Fourth National Conservation Congress, held at Indianapolis, Ind., October 1st to 4th, the following members being in attendance as delegates: Dr. H. K. Beatty, Superintendent of Sanitation, Health Department, Pittsburgh, Pa.; Prof. Jas. McLaren White, School of Architectural Engineering, University of Illinois, Urbana, Illinois.; Dr. J. J. McShane, Health Commissioner of Kenosha, Wis.; Mr. C. B. Ball, Chief of Sanitary Bureau, Health Department, Chicago, Illinois; Mr. Wm. G. Williamson, Chief Inspector of Plumbing Dept., Detroit, Mich. The International Conservation Congress requested that the delegates of this society to participate in the discussion of the "Conservation of Vital Resources".

What He Had.

Georgia Lawyer (to colored prisoner)—Well, Ras, so you want me to defend you. Have you any money?

Rastus—No, but I've got a mule and a few chickens, and a hog or two.

Lawyer—Those will do very nicely. Now, let's see; what do they accuse you of stealing?

Rastus—Oh, a mule and a few chickens and a hog or two.—Life.

OBITUARY.

John F. Merrill.

John F. Merrill, vice-president of the plumbing supply concern of Holbrook, Merrill & Stetson, Sixth and Townsend Streets, San Francisco, Cal., died at his home in that city on Tuesday, October 1st.

William Horace Corbin.

William Horace Corbin, vice-president of the Joseph Dixon Crucible Co., Jersey City, N. J., died at his home in that city on Wednesday, September 25th, according to announcement issued by that company.

John McAdam.

John McAdam, a retired master plumber, died Saturday, September 28th, at his home, 1305 Park Place, Brooklyn, N. Y., in his 51st year. Mr. McAdam was born in Glasgow, Scotland, and he came to Brooklyn from Montreal four years ago, some time after his retirement from business.

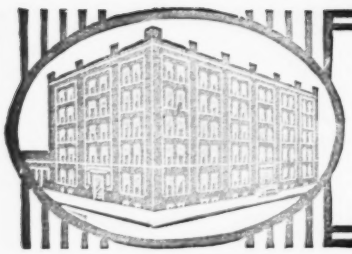
Nelson T. Little.

Nelson T. Little died suddenly on Wednesday morning, September 18th, from a rapid attack of diphtheria which developed while he was in Peoria, Ill., on a business visit. Mr. Little was manager of the Louisville branch of the Pittsburgh Water Heater Co., Pittsburgh, Pa., with which company he has been connected since 1906. His promotion after joining the sales organization of that company was rapid, and in 1911 he was awarded the managership of the Louisville branch, where he made a great success. Mr. Little's death will come as a great shock to his many friends in the middle West, as he was a most successful and aggressive business man and well known and esteemed by the majority of the plumbing and gas fraternity in this territory. He was 34 years of age, a bachelor, and the only son of W. H. Little of Kansas City. He was an officer of the South Gage Lodge of Kansas City, as well as member of the National Commercial Gas Association and the Indiana Gas Association.

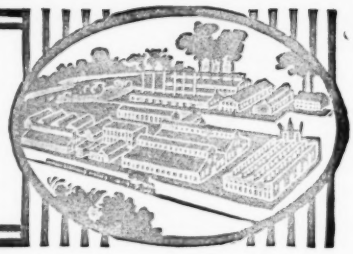
Benjamin Spearman.

Benjamin Spearman, president of the Imperial Company, manufacturers of plumbers' brass goods, at Grove City, Pa., died suddenly from a stroke of paralysis at his home in that city on Tuesday, October 1, in his 48th year. Mr. Spearman was born at Wheatland, Pa., in 1865, and he received his education in the local public school and at Graylock Institute, Wooster Academy and Stevens Institute of Technology. After leaving school he spent three years in Mexico and one year in the Argentine Republic in railroad construction. He was thereafter associated with his father in the management of the Spearman Furnace Co. at Sharpville, Pa., until they sold their plant in 1900. After this he was for some years engaged in zinc mining in Joplin, Mo. In 1906 he came to Grove City, Pa., and took an active interest in the business affairs of the town. He became president of the Imperial Company and the Bessemer Foundry Co., and a director of the Grove City Hospital and the Grove City Building and Loan Association. He was a thirty-second degree Mason and a member of the Duquesne club and the Athletic club, both of Pittsburgh. He is survived by his wife, a son and a daughter.

Utica, N. Y.—Chas. Trosset, of this city, is installing up-to-date plumbing systems in twelve residences here.



News of Interest Among the Wholesalers and Manufacturers



WILL MANUFACTURE SANITARY DRINKING FOUNTAINS.

The Sanitary Fountain Co., of Spokane, Wash., has been incorporated with a capital of $100,000 to manufacture drinking fountains. The incorporators are T. G. Partington, George H. Walters and John J. Walters.

LOCKE & SMITH CO. IN HANDS OF RECEIVER.

The Locke & Smith Co., jobbers of plumbing supplies at 355 West 36th Stret, New York City, went into the hands of a receiver on Friday, September 27th, James F. Conran being appointed to serve in that capacity by Judge Mayer. The liabilities are said to amount to $56,500 and the good assets to $30,000.

THE MARK-LALLY CO. OPENS NEW BUSINESS HOME.

The formal opening of the new building of the Mark-Lally Co., at 235 to 249 Second Street and 65 to 99 Tehama Street, San Francisco, Cal., was held on Monday, September 30th, and a large number of the company's friends called to inspect the quarters. Many beautiful floral tributes were tendered the management by the visitors and H. T. Lally, who acted as host upon the occasion, was about the happiest plumbing supply jobber in town that day. The new building is 75 x 275 feet, with three stories and basement. It is fireproof, being constructed throughout of reinforced concrete, modern in all its appointments, and one of the largest establishments of its kind on the Coast. The offices, stock rooms and show-rooms are located on the main floor; the basement is given over to the machine shop, shipping department and pipe storage; and the second and third floors are used for warehousing stock of various kinds; engines, windmills, wood work, enameled ware, boilers, etc. The complete cost of the lot and building is about $200,000. The old corrugated iron building of the Mark-Lally Co., at First and Folsom Streets, is to be torn down and the material shipped to Stockton and San Jose, at which two places warehouses for plumbing supplies will be erected by the company to facilitate its country business.

FALL TOURNAMENT OF EASTERN TRADE GOLF ASSOCIATION ENDS.

The fall tournament of the Eastern Trade Golf Association closed Thursday, Oct. 3rd, at the White-Marsh Valley Country Club, Chestnut Hill, Philadelphia, Pa.

In the eighteen hole medal play handicap for a cup presented by Charles S. Prizer, president, J. M. Kipe was the winner with a net score of 84. Second prize was won by C. S. Wood with a net score of 85. M. E. Danforth won third prize, a net score of 86.

In the match play against Bogey, G. E. Sly was the winner. R. B. Hunt was second and C. C. Hale was third.

In the foursome competition the winners were F. K. Chew and James A. Donnelly who received gold medals. W. C. Matlack and E. S. Aitkin received silver medals by coming in second.

The consolation prize was won by Henry B. Gombers.

The official scores as compiled by Captain J. B. Garfield follow:

Morning Round.

Name	Out	In	Gross Score	Handicap	Net Score
J. M. Kipe	46	47	93	9	84
C. S. Wood	57	53	110	25	85
M. E. Danforth	50	44	94	8	86
E. H. Giles	55	58	113	25	88
C. S. Prizer	54	50	104	15	89
C. C. Hale	52	53	105	14	91
J. B. Garfield	48	43	91	0	91
G. E. Sly	60	43	103	12	91
C. R. Fowler	58	57	115	22	93
G. H. Chasmer	49	51	100	6	94
R. B. Hunt	59	53	112	18	94
S. K. Bowker	56	50	106	12	94
W. H. Burnett	56	50	106	12	94
W. Bowers	64	61	125	30	95
E. S. Aitkin	58	59	117	22	95
Steven Roberts	52	49	101	5	96
F. J. Oliver	52	56	108	12	96
L. Moore	61	62	123	27	96
W. C. Matlack	60	61	121	24	97
G. H. Bell	46	52	98	0	98
A. S. Armagnac	62	54	116	15	101
E. C. Molby	61	50	111	10	101
W. G. Culbert	55	64	119	18	101
Geo. M. Scott	67	66	133	27	106
H. R. Watson	60	61	121	14	107
G. W. Pierpont	57	67	124	16	108
W. G. Gilmour	68	74	142	32	112
Frank K. Chew	82	68	150	36	114
F. C. Eckfeldt	65	74	139	25	114
W. G. LeCompte	89	61	150	32	118
Jas. A. Donnelly	89	83	172	36	136
Henry B. Gombers	111	108	219	50	169

Afternoon Round.

Name	Out	In	Gross Score	Handicap	Net Score
Jas. A. Donnelly, Frank K. Chew	58	53	111	36	75
W. C. Matlack, E. S. Aitkin	49	53	102	22	80
M. E. Danforth, G. S. Chasmer	42	47	89	6	83
A. S. Armagnac, R. B. Hunt	52	46	98	15	83
G. E. Sly, E. C. Molby	45	48	93	10	83
E. H. Giles, C. R. Fowler	51	56	107	22	85
L. Moore, C. S. Wood	57	54	111	25	86
S. Roberts, W. H. Burnett	45	47	92	5	87
H. R. Watson, G. W. Pierpont	55	46	101	14	87
F. C. Eckfeldt, W. G. Culbert	53	52	105	18	87
C. C. Hale, F. J. Oliver	49	50	109	12	87
J. B. Garfield, G. H. Bell	42	45	87	0	87
G. M. Scott, W. G. LeCompte	58	58	116	27	89
J. M. Kipe, W. Bowers	50	50	100	9	91
S. W. Bowker, Chas. S. Prizer	54	52	106	12	94

PERSONAL MENTION.

F. L. Hays, for several years manager of the Chicago branch of the H. Mueller Mfg. Co., of Decatur, Ill., will after October 21st make his headquarters at Oklahoma City, Okla., from which he will cover Oklahoma and Arizona in the interest of the Mueller company. His many friends in Chicago are sorry to see him leave, but wish him all possible success in his new and larger field.

* * *

M. T. Whitney, for many years connected with the Chicago branch of the H. Mueller Mfg. Co., has been appointed manager of this branch to succeed F. L. Hays.

* * *

P. J. Frey, president and treasurer of the Central Supply Co., of Minneapolis, Minn., was registered at the Hotel Sherman in Chicago this week.

* * *

John Keikel, until recently employed with Cahill, Swift & Co., of St. Louis, as purchasing agent, has joined the selling force of The Sanitary Co., of Cleveland, O., and will handle the company's business in Missouri and Iowa.

* * *

The many friends of G. P. Blackiston of Canton, Ohio, whose advertising ability as shown in the Never Split Seat Co's. announcements, is well recognized, will be pleased to hear that he is now a benedict. On October the third he was married to Miss Bessie Wilkins, and the happy couple are now at home to their friends at 317 Erie street, Canton.

L. B. JENKS AND F. A. LATHROP MOVE THEIR OFFICES.

L. B. Jenks and F. A. Lathrop, Chicago representatives for the Youngstown Sheet and Tube Co., and the Pittsburgh Valve & Fittings Co., are moving their offices from 1147 Marquette Bldg., to 1563 McCormick Bldg. They expect to be settled in their new quarters within the next few days.

ATTRACTIVE NEW CATALOG OF "SECURITY" BOILERS.

The Security Foundry Co., of Minneapolis, Minn., have just issued a most attractive catalog of their line of steam and hot water boilers. These are built, as they say, to compete with Northwest winter weather, which has a faculty of putting any boiler to its most severe test. The catalog is attractively printed in colors and is complete with ratings of the line.

TYLER'S DOMESTIC HOT WATER GENERATOR.

Among recent conveniences for the plumber is a hot water generator for use near the fire in a warm air furnace, hot water or steam boiler, or even an ordinary heating stove. This device, it is claimed, takes the place of the hot water coil, and has the advantage of being placed in any position desired within heating distance.

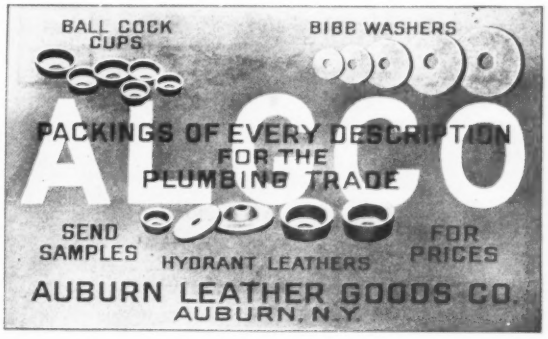
For larger installations a disc is used, to which are fitted nipples with caps, these to be used in such lengths as necessity requires.

These heating specialties are manufactured by Frederick A. Tyler, 34 Beaver Street, Albany, N. Y., and can be obtained from supply houses generally. Complete circulars can be obtained from the manufacturer. Mention "Domestic Engineering".

POST CARD OF AUBURN LEATHER GOODS CO.

The trade have no doubt noticed the post card recently sent out by the Auburn Leather Goods Co., of Auburn, N. Y., of which a reduced illustration is reproduced herewith.

This company manufactures a very complete line of leather packings for all purposes, included in which are

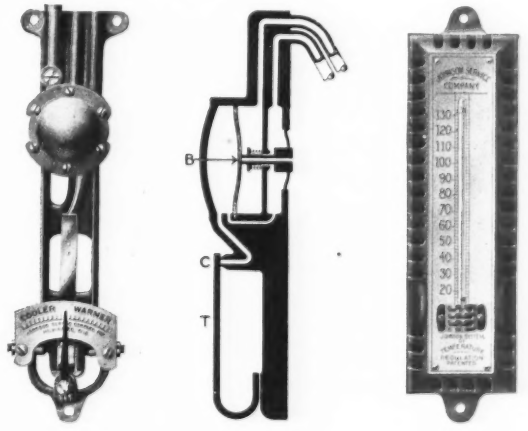


Miniature Facsimile of Auburn Leather Goods Co's. Post Card.

bibb washers, ball cock cups, hydrant leathers, etc. Their trade name "Algco" is well known. A complete catalog of the entire line is now being prepared, and will be forwarded to those who write for it to the above address.

THE JOHNSON INTERMEDIATE THERMOSTAT.

The Johnson Intermediate or Graduated Thermostat is designed to operate in connection with double damper fan blast systems of heating, where it is desired to mix heated air with tempered or cold air in proper proportions to maintain a desired room temperature. In operation it holds each blade controlling the supply of hot and tempered air partially open in such relative fixed po-



Section Movement. Cover.

Johnson Intermediate or Graduated Action Thermostat.

sition as to keep the room at a certain pre-determined temperature, as long as the temperature of the heated and tempered air and other conditions remain the same, but immediately changes the relative positions of the dampers when any conditions change. It is constructed on the principle of a reducing valve, varying the pressure on the main diaphragm by an auxiliary valve thermostatically controlled. This thermostat is manufactured by the

Johnson Service Company, Milwaukee, Wis., and is obtainable from the factory and different branches of the company.

ENAMELED TANK COMPANY'S NEW CATALOG.

Catalog H of the Kazoo line of enameled closet tanks and combinations, manufactured by the Enameled Tank Co., Kalamazoo, Mich., is just from the press and ready for the trade. It is attractively gotten up, with a cover embossed in white on a blue background, and enclosed in a figured transparent wrapper. The sixteen pages within are replete with illustrations of the line, amply large and finely engraved. Those who have not yet received a copy should write for one, mentioning "Domestic Engineering".

NEW MUELLER "RAPIDAC" HANGER.

There is now being mailed to the plumbing trade a most attractive hanger depicting the new "Rapidac" line of compression work, manufactured by the H. Mueller Mfg. Co., of Decatur, Ill. The illustration herewith can give but a faint idea of its beauty.

By a special process the hanger has been made transparent, so that by placing it against a window or before other light it is made doubly noticeable.

H. Mueller Mfg. Co's. "Rapidac" Hanger.

One of the best lithographic artists in the country devoted considerable time to this hanger, and on account of the clever design submitted by the advertising department of the Mueller Company, was spurred to make this a most unusual production.

Those who have not received this hanger should request the H. Mueller Mfg. Co. to make sure that their names are on the mailing list. Mention "Domestic Engineering" in writing.

THE C. & L. NO. 1 FIRE POT.

The Clayton & Lambert Mfg. Co., of Detroit, Mich., manufacturers of gasoline burning tools, are calling especial attention of the trade to the C. & L. Fire Pot No. 1, which is illustrated herewith. The tank is constructed of heavy galvanized iron to better withstand hard usage, as this material is more easily repaired in case of damage than brass or any other metal. A patented automatic brass pump fitted into the tank quickly produces ample air pressure which is steadily maintained by means of a double spring automatic check valve in the base of the pump. The burner produces an intensely hot blue flame and will quickly heat 12 lb. coppers while melting a kettle of lead or babbitt at the same time. The top section is heavily constructed and is fitted with a cover which protects the flame from wind or extreme cold. The manufacturers claim that this torch is superior to anything else of its kind. Interested parties can secure further details by writing to the Clayton & Lambert Mfg. Co.

The C. & L. No. 1 Fire Pot.

PASS SEVERE EXAMINATION FOR PLUMBING INSPECTORS.

The Civil Service Commission, of Cleveland, O., recently conducted a civil service examination for the position of chief plumbing inspector and seven assistant plumbing inspectors.

Five candidates entered the list for the position of chief and twelve for assistants. The Civil Service Commission secured the services of three representative master plumbers to prepare a list of questions to be asked and conduct the oral examination on plans. They also secured questions from other sources from which they prepared what was admitted by the applicants to be a very severe examination, calculated to test their practical and administrative ability.

The result of these examinations was particularly gratifying to the city officials who were responsible for the appointment of the inspectors prior to their examination, as the present incumbent of the office, J. J. O'Neil, stood at the head of the list with a rating of 92⅛ for chief plumbing inspector and all but one of the assistants passed a creditable examination.

J. J. O'Neil, who held the position during ten years of democratic administrations prior to 1910 and was reappointed when the present democratic administration took office in January of this year, and M. Gallagher, his popular assistant, the only one to continue in office through a change of administrations, and who has held the position for years, were the recipients of many congratulations from city officials and plumbers when the result of the examination was made known.

The other successful candidates to pass the examination for chief were Mr. J. Dress and Mr. J. Bause, and for assistants; F. W. Reutopohler, Eugene Rogers, Jno. F. Smith, Chas. N. Nickel, Edward G. Henry, Wm. Siebenwright, W. Wainwright, John H. Mooney, Jno. McDonnell, Fred Witte.

Among the Plumbing and Heating Contractors

NEWS FROM PHILADEPHIA AND VICINITY.

A. Winterholer, 2812 North Third Street, Philadelphia, is installing the plumbing in a building at Adams and Sepviva Streets.

Bulman Bros., 2532 North Fifth Street, are installing a new plumbing system in the West Philadelphia High School.

Paul J. Hoft, 248 South Eighth Street, Philadelphia, has been awarded the contract for heating and plumbing in five new houses on East Chelten Avenue, for B. Finberg.

H. W. Meier, 4th and Green Streets, Philadelphia, has quite an extensive plumbing job at the New Fire House, 6th and Lehigh Avenue.

Jos. C. Brown, 5503 Mascher Street, Olney, Pa., is doing the plumbing and heating in the palatial residence, which is being built by the Old York Road Improvement Co., and he has also been awarded the contract for four new houses which are being erected in Olney, for Chas. Townsend.

Chas. D. Fricka, 1328 North Seventeenth Street, Philadelphia, is doing extensive alterations in the plumbing system in the dwelling of J. Bailey, at 15th and Master Streets, Philadelphia.

J. E. Eyanson & Son, 207 South 8th Street, Philadelphia, has been awarded the contract for plumbing in the five-story building for Steel Heedle Co., at 21st and Lippincott Street, Philadelphia.

Fr. Flynn, of 3317 New York Road, Philadelphia, has purchased the plumbing business of E. Nebhuth, at Logan, Pa., and he is now conducting business at the two places.

Powers & Magee, 5645 Chew Street, Philadelphia, are doing the plumbing in four houses for the Houston Estate on Benezet Street, Chestnut Hill.

Flynn & Love, of Sansom Street, Philadelphia, have been awarded the contract to do the plumbing in the new Brewery which is being erected at 10th and Montgomery Avenue, for Class & Nachod.

Mason K. Fry, 728 Spring Garden Street, Philadelphia, is doing the plumbing on the additional wing at the German Hospital.

Hoben & Doyle, 21st and Pine Streets, Philadelphia, have been awarded the contract for plumbing the new Hotel Vendig, Thirteenth and Filbert Street, Philadelphia. This is quite a large-sized job having over two hundred bathrooms, some of which will be equipped with shower baths.

NEWS FROM OHIO.

Lima.—Architect F. L. Packard of Columbus, is preparing plans and specifications for a complete water system for the Lima State Hospital. One tank will have a capacity of 150,000 gallons and another 40,000 gallons. Bids will be received by the board of commissioners on October 17, for the necessary labor and materials for a soft water concrete reservoir to be erected upon the grounds of the institution.

Fremont.—A movement is on foot for the establishment of public toilets in the city of Fremont. It is proposed to erect several comfort stations in the downtown district of the municipality.

Columbus. — In the forthcoming October bulletin of the Ohio State Board of Health, attention is called to the lack of a proper sewage system at Put-In-Bay Ohio, where thousands of visitors go every summer. The board demands the installation of a proper sewage system.

Cleveland.—The Nepo Supply company of Cleveland, has been incorporated with a capital of $10,000 to deal in plumbing supplies of all kinds. The incorporators are E. N. Ulrey, B. F. Koch, E. J. Bryant, W. C. Gannon and L. R. Clawson.

Columbus.—The comfort station which was erected by the municipal authorities at Naghten and High streets, Columbus, for the Ohio-Columbus centennial celebration, will be made permanent. The work of locating other comfort stations in Columbus will be taken up at once.

Toledo.—The J. D. Dinsmore Co., of this city has been incorporated with a capital stock of $10,000 to conduct a general heating and plumbing business. The incorporators are J. D. Dinsmore, John L. Hodge, Fred Gruber, Jack Gallagher and William Gellerd.

Columbus.—An appropriation of $25,000 has been asked from the city council of Columbus, for the erection of a shelter house and comfort station at Franklin Park. It will be similar to the one being erected in Goodale Park.

A MODERN PLUMBING AND HEATING ESTABLISHMENT.

The accompanying illustration shows an exterior view of the modern office and show room of R. Kohls & Co., 3128 W. 25th Street, Cleveland, O. This enterprising plumbing and heating concern reports a very successful year, and has on hand at the present time the following

R. Kohls & Co's. Plumbing and Heating Establishment In Cleveland, O.

contracts: Plumbing, gas-fitting and sewering in ten new residences on West 103d Street for Mrs. J. McArthur, and numerous other contracts amounting in all to over $25,000.

NEWS FROM NEW ENGLAND.

Massachusetts.

Whitinsville.—Stone & Underhill, of Boston, have completed the installation of a heating and ventilating system in the high school building at Uxbridge and are now at work on a similar contract for the addition to the Center school building.

Westminster.—The Royal Steam Heating Co. has the contract for a heating plant for the new school building. John R. Carey of Gardner will do the plumbing.

Easthampton.—J. P. Ryan has the contract for installing a steam heating plant in Barnett & Lynch's new block, and heating and plumbing in the new Polish church at Northampton. C. C. Coates has the plumbing of a two family house on Searle Avenue for Frank Searle, and he is just completing the plumbing and heating in the new high school building. He also has two contracts in Florence and another large one in Springfield. The Manchester Co. is installing a steam heating plant in the Pascommuck Club building, steam heating and plumbing in John Wanat's new house on Clark street and has several other contracts on hand. Forbes & Hatch have the contract for plumbing a two apartment house for George Vaughn on Northampton Street, plumbing the

Moore & Knot house on Chestnut Hill, E. M. Torrey's two apartment house on Chestnut Hill, steamheating in the Mather block on Payson avenue, plumbing in a new house on Fairfield avenue for John Cullen.

Westboro.—The contract for a new heating plant for the Evangelical church has been awarded to George H. Putnam.

Holyoke.—Gavin & Moriarty, plumbers, are erecting a new building at Willimansett for their own use. The building is nearly completed.

Worcester.—Braman, Dow & Co., of Boston, has been awarded the contract for heating the George H. Ward Memorial Building which is now in process of construction here.

Springfield.—J. J. Cotter Co., of Dwight Street, has shown much energy in its chosen line and, while Mr. Cotter himself is the proud owner of several motor cars, he has equipped a plumbing and heating establishment in this city which is a model one. Some of this company's contracts are: Plumbing in Dunlap Realty Co.'s new building at Main street and Railroad Row, consideration, $20,000; plumbing in West Springeld School, $3,300; plumbing in St. Stanislaus Parochial School, $3,600; plumbing and steam heating in North Street Engine house, $6,000; plumbing and heating in Lerche's hotel, on State Street, $4,000. In addition to this work they have contracts for the plumbing installation in approximately forty new residences.

Connecticut.

Bridgeport.—Contracts for changes in the clubhouse of the Park City Yacht Club have been placed. W. J. Snadecki will do the plumbing.

Waterbury.—J. Devine & Sons are installing plumbing and heating in Edward Spencer's new house on Highland Avenue and have the following contracts also in hand; heating system in house of Harry Katz on Spencer Avenue, heating system for D. J. Mahany, Estate on Bank Street, heating plant in house of Louis Martin on Greenmount Terrace, heating Arthur Nichol's house on Congress Avenue and heating Antonio Mansini's house on High street. F. W Engert & Son have the contract for the plumbing in a three apartment house being erected on Plaza Avenue for Owen J. Hurley.

New Haven.—The contract for steam heating in the new church building being erected on Blatchley Avenue for St. Rose Roman Catholic Parish has been awarded to Thomas F. Meagher.

Rhode Island.

Cranston.—The contract for the new steam heating plant for the Lippitt Hill schoolhouse has been awarded to the lowest bidder, James H. O'Loughlin of this city.

New Hampshire.

Portsmouth.—Thomas R. Watson, of this city has secured the contract for the plumbing in the First Methodist church, now being built here.

NEWS FROM THE PACIFIC COAST.

Announcement has just been made by the constructing quartermaster at Fort Mason that the Presidio Military Reservation is shortly to be equipped with a gravity fuel oil system for the accommodation of the residents in the reservation. The plant to be installed will have a capacity for supplying oil for five hundred inhabitants. The innovation will mean a saving of 70 per cent over the cost of coal fuel.

Sealed bids are at present being received at the office of the city clerk of Los Angeles for installing a heating and plumbing system in the East Side Police Station of Los Angeles.

The city authorities of Walla Walla, Wash., are considering the advisability of having a central heating plant installed for the business district. E. L. Murphy of Seattle is negotiating for a franchise to install the plant.

St. Louis, Mo.—The H. F. Fix Heating & Ventilating Co. has embarked in the heating business at 1522 Olive Street. L. A. Gibson, well known to the St. Louis trade, is superintendent of this company

Cleveland, O.—Frank Hilderbrand, 9401 Cedar Avenue, one of the nestors in the Master Plumbers' Association of Cleveland, has followed his chosen trade for some forty-two years, thirty years of which he has conducted his own business. He informed a representative of "Domestic Engineering" that this is an unusually prosperous year for him and that he has on his books some good-sized contracts which will keep his force of workmen busy until late in the season.

CONTRACTS AWARDED.

Auburn, Nebr.—C. A. Snider has been awarded the contract to install the plumbing and heating systems in the new home being erected by W. H. Bousfield.

Wadena, Minn.—J. M. Robb & Co. have secured the contract to install the heating and ventilating system in the new high school building at McIntosh, Minn., at a price of a little more than $8,000.

Norristown, Pa.—Contract for installing hot water heating system in the house of detention, 521 Cherry Street, has been awarded to the J. Frank Boyer Plumbing and Heating Co., of this city. The contract price was $769.93.

Chariton, Iowa.—G. W. Ensley has secured the contract to install the heating plant in the Burlington passenger depot in this city, at a figure of nearly $2,500.

Laurel, Miss.—S. A. Carnes of this city has been awarded the contract to install the heating system in the girls' new dormitory at the agricultural high school at Poplarville, Miss., at a figure of $7,525.

Beaver Creek, Minn.—F. E. Henton has secured the contract to install plumbing and heating systems in the new residence of Mrs. Cummings.

Pensacola, Fla.—Chas. A. Boer has secured the contract for the completion of the plumbing work in the county jail, on his bid of $3,850.

Albany, N. Y.—James D. Walsh's Sons were the fortunate bidders on the plumbing work for the new Elks' Club house here. They also have on their books the plumbing and heating work for four new residences in the Delaware Avenue section.

Troy, N. Y.—J. J. Horan & Co., River Street, were the fortunate bidders for the steam heating plant to be installed in the Islip State hospital at Central Islip, L. I. They also have the contract for the plumbing and the power work equipment in a new building here for the Freihofer Bakery Company.

Utica, N. Y.—H. C. Peterson & Co., Oneida Square, is one of the busiest plumbing and heating firms in western New York. This firm has just completed the steam heating installation in the Albany street school here, and it is at the present time engaged with a similar installation in a wholesale dry goods house on Broad street, as well as with the plumbing and heating work in a new building for the New York State Hospital, also in this city.

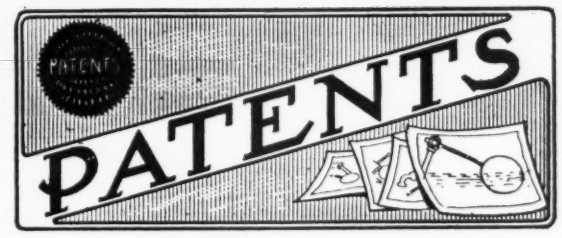
Albany, N. Y.—F. F. Ryder, Madison Avenue, in addition to plumbing contracts for fifteen different residences, is engaged with the plumbing installations in a new garage for Rayno Bros. & Reed, and in an apartment house for The Ryder Building Co., Schenectady, N. Y.—J. H. Pangburn of 240 Liberty Street, has built up a lucrative business. In addition to his string of regular contracts he does many repair jobs in the plumbing line. His latest acquisition, however, is a new "Schacht" automobile. He's now about the swiftest thing in town.

Albany, N. Y.—M. J. Hawkins, of Orange Street, has secured a lot of splendid contracts of late. Here are a few of them: Hot water heating in the Industrial building at St. Vincent's Male Orphan Asylum, consideration, $5,700; steam heating in factory on Hudson Avenue, for Kingsbury & Leahy, price, $3,300; steam heating, plumbing and ventilating in Albany Grand Theater, consideration, $20,000; vacuum heating in St. Joseph's Roman Catholic church, $14,000; vacuum heating in new Elks' Club house, $9,000; steam heating in new building being erected here for Hoy & Co. In addition to this work, Mr. Hawkins has heating contracts for approximately fifty different residences.

"It seems to me," said a customer to his barber, "that you ought to lower your price for a shave in these hard times."

The barber shook his head and said:

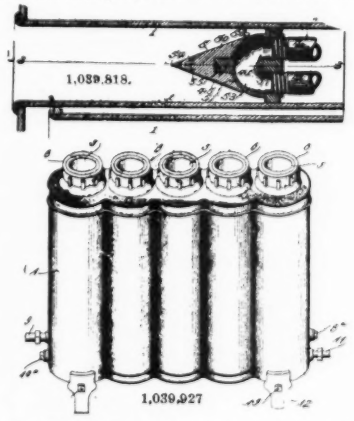
"Can't be done. Nowadays everybody wears such a long face that we have a great deal more surface to shave over!"—Life.

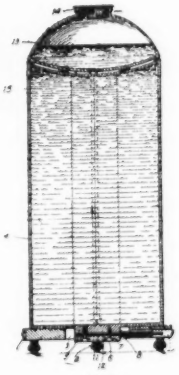


Heating Department.

1,039,818. Steam-Pipe Shield. Marion Sanders, Poplar Bluff, Mo., assignor of one-half to Gus Lynch, Poplar Bluff, Mo. A shield for the return bends of superheating steam pipes in boiler tubes, comprising a substantially conical shaped body including a spear-like solid head having means for fitting onto the outer end of the return end of the return bend of the pipe, and for removably holding it on said bend, said means including resilient members adapted to be sprung over the return bend for engaging with the grooves between the parallel ends of said bend, said spear-like head tapering from said return bend and extending a distance beyond the same greater than the length of the bend.

1,039,927. Heat-Radiator. Hiram V. Gorrell and John B. Gorrell, Kendallville, Ind. A radiator comprising an elongated chamber having side walls, opposite outwardly rounded end walls connecting said side walls and top and bottom walls, said side walls being similarly sinuous in horizontal section and the concave and convex portions thereof being respectively opposite one another, transverse braces integral with said side walls and connecting opposite inwardly convex portions thereof, said top and bottom walls having vertically registering openings concentric with the spaces bounded by inwardly concave portions of said side walls, open-ended pipes passing through said openings and secured therein means for supplying said chamber with a heating medium and means for discharging the same therefrom.

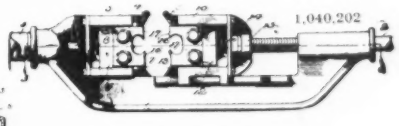


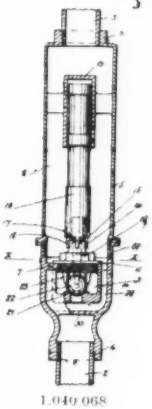


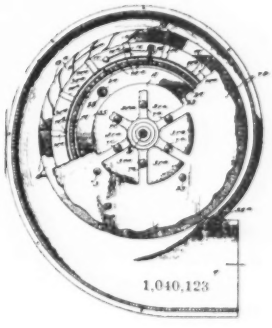
1,039,976. Portable Steam or Hot-Water Radiator. Arthur R. Little, Stockton, Cal. A device of the character described comprising a portable base, a receptacle bolted therein, such receptacle having an outer corrugated surface on its sides and a concave surface on its upper end, an auxiliary receptacle having a convex surface fitting into said concave surface on said first named receptacle, a pipe connecting the lower end of said auxiliary receptacle with the lower end of said first named receptacle, and means for heating said first named receptacle, as described.

1,040,202. Pipe-Cutter. Alfred F. Howe, Nutley, N. J., assignor to the Borden Co., Warren, Ohio, a corporation of Ohio. A pipe cutter comprising a frame having two jaws extending laterally therefrom in line with each other, one jaw being fixed and the other adjustable, and an adjustable handle carried by said frame and engaging the adjustable jaw, each of said jaws having a housing open at its inner end, carrier blocks fitted in said housings, stops for said blocks, springs within the housings acting on said blocks, and cutters and guides carried by said blocks with a clearance between each cutter and its respective guide, such cutters and guides being equi-distant on opposite sides of the centers of said jaws, the pipe-engaging ends of said guides, being on a greater radius than the cutters, and said springs being placed under tension, by the engagement of the cutters with a pipe when the jaws are brought into pipe-engaging position.

1,040,068. Relief-Valve. John C. Watson, Terre Haute, Ind., assignor of one-half to David L. Watson, Terre Haute, Ind. In a relief valve, the combination, with a casing provided with a partition having a regulator valve-seat







and separating the casing into upper and lower chambers, said casing having also a bridge-piece extending crosswise between the side walls of its lower chamber and having a return passage extending through it and communicating with the upper chamber and having an outlet into the lower chamber; of a regulator bar provided with a valve which normally closes the passage through the regulator valve-seat, a guide-cap secured in the upper chamber and inclosing the upper portion of the regulator bar and limiting its lift, and a return valve which normally closes the said outlet.

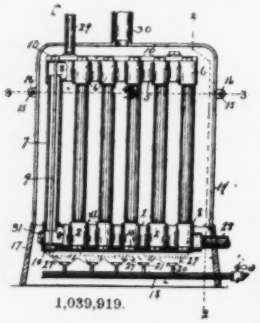
1,040,123. Ozonizer. Harold E. Beck, Chicago, Ill. In an ozonizer, a source of high-voltage electric current, a rotary fan adapted to maintain a continuous flow of air, a continuous electrode secured to the inner periphery of and adapted to revolve with said fan, a second continuous electrode, a thin dielectric interposed between said electrodes and in close proximity to one of them and extending over the entire area of discharge.

Plumbing Department.

1,039,919. Gas Water-Heater. Alexander W. Finlayson, Detroit, Mich., assignor of one-fourth to Theobald Schunk, Toledo, Ohio, and one-fourth to Robert C. Sturgeon, Ojibwa, Canada. In a water heater, the combination of hollow water heads in superimposed relation, each head being oblong in form and having spaced lateral projections extending from the opposite sides thereof and each of said projections on said heads having a beveled aperture through the lower and upper wall thereof respectively, each of said heads also having a single water chamber common to and in communication with all of said lateral projections, a plurality of rows of water tubes having tapered ends, the outer rows of said tubes being seated in the beveled apertures in the projections on said heads and the inner row being seated in the beveled apertures in the heads between said projections, said tubes being arranged in longitudinal and transverse alinement, tie-rods passing through the lateral projections on the water chambers and through said tubes to connect said parts a casing embracing said heads and tubes, the lower portion of the casing forming a combustion chamber, and a burner in said chamber below the lower head.

1,039,950. Burner-Supply Connection. William R. Jeavons, Cleveland, Ohio. The combination with a pipe having an aperture in the wall thereof of a side branch

connection comprising a fitting having a tubular projection, a nipple inserted into said aperture, a washer of compressible material surrounding said nipple, a sleeve inclosing said washer, said sleeve being of greater diameter at one end than the end of said projection to receive said projection therewithin and having at its opposite end an inwardly projecting flange of greater internal diameter than the external diameter of the adjacent portion of said nipple, and means for forcing the end of said projection against said washer.



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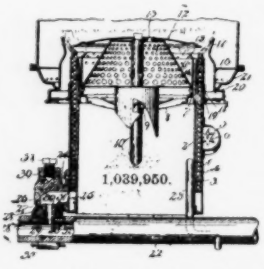
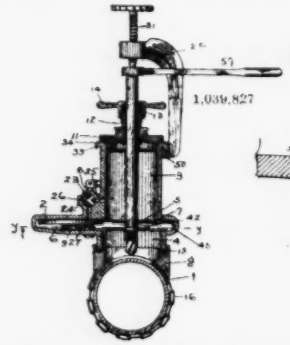


1,039,950.

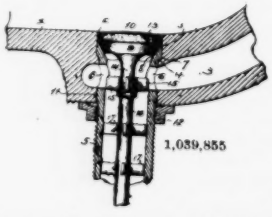
1,039,827. Appliance for Tapping Water-Mains. Frank P. Sharp, Oakland, Cal. In an appliance for tapping pipes carrying fluids under pressure, the combination of a casing having a laterally extending valve chamber on one side, a slidable valve adapted when opened to be seated in said chamber and when closed to separate the casing into an upper compartment and a lower compartment, the said lower compartment communicating at all times with the said valve chamber, a valve seat for conducting fluid arranged between the said valve chamber and the upper compartment of the casing and comprising a thickened portion of the wall of the casing located in the exterior angle between the upper portion of the casing and the laterally extending valve chamber, and a valve mounted in the said valve seat, operatable from the outside of the casing and arranged, according to its adjustment, to establish communication between the said upper and lower compartments, or to cut off communication.

1,039,903. Sanitary Fixture. Raymond E. Crane, Cameron, W. Va. A lavatory or other sanitary fixture, a supporting bracket for same containing two side arms, a three-point bearing from said bracket for the holding of said lavatory, means of adjustment of the elevation of each side of the lavatory, and means for locking said lavatory to the bracket, substantially as described.



1,039,827

1,039,908

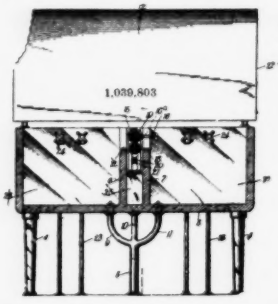


1,039,855

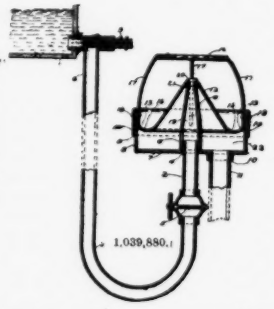
1,039,855. Lavatory. Henry M. Weaver, Mansfield, Ohio. The combination with a lavatory having a waste outlet provided with an annular bearing below its upper end, and a waste pipe having an annular bearing which seats upon and is supported by the annular bearing in the waste outlet, said waste pipe being provided at its upper end with a valve seat which is located below the upper end of the waste outlet, of a plug valve adapted to engage the valve seat and provided with a cap which fits the walls of the waste outlet above the valve seat, the upper surface of the cap being flush with the inner surface of the lavatory, substantially as set forth.

1,039,803. Washtub. Joseph J. Reilly, Newark, N. J. The combination of a tub, a pair of partitions mounted therein and suitably spaced apart, each partition being provided with a gap, the space between the partitions being adapted to receive a wringer, the bottoms of the said gaps being disposed below the upper edge of the said tub whereby material may pass through the wringer from one side of the tub to the other, together with a drain pipe communicating with the said space and the said sides of the tub.

1,039,880. Sanitary Drinking-Fountain. Charles Dwight Avery, Cheyenne, Wyo. In a drinking fountain a water



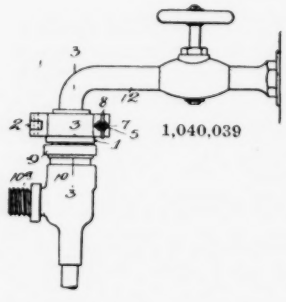
1,039,803



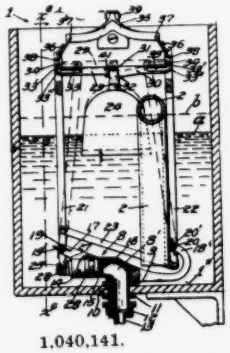
1,039,880.

pipe with a control valve therein, said pipe supporting an inner cone having an inner chamber connected with said pipe and an outer chamber formed by flanges at the base of said inner cone, said inner chamber having an opening at the apex of the cone and said outer chamber having an outlet, an outer cone supported above said inner cone having an open apex coinciding with the open apex of the inner cone, said outer cone having a flange at its base with drains into the outer chamber of the inner cone, with a guard ring held by supports attached to said outer cone above and symmetrical with the open apex of the outer cone, substantially as described.

1,040,039. Connection for Water Distribution. Benjamin F. Shapro, San Francisco, Cal. The combination of a base provided with a wall on one side, and a tubular projection on the opposite side, a clamping member hinged at one end to the wall and adapted to pass over the base, means for detachably clamping said wall and clamping member together, said base having a laterally projecting hub, a tubular resilient ring receiving said hub and fitted between said wall and clamping member, said hub being provided with a flat inner end and having a boss of less diameter than the hub projecting laterally



1,040,039



1,040,141.

therefrom, and a flexible ring fitted within the outer ring and receiving said boss, said hub and boss being between the wall and clamping member.

1,040,141. Float-Valve. Roy H. Canfield, Los Angeles, Cal. The combination with a supply valve, of two pivoted levers, one of which is connected below its fulcrum with the valve to open and close the valve, a connecting rod connecting the first lever above its fulcrum with the second lever below the fulcrum of the second lever, arms pivotally connected respectively with the levers above their fulcrums, a float, and means pivotally connecting the arms and the float between the levers to open and close the valve on the downward and upward movement of the float.